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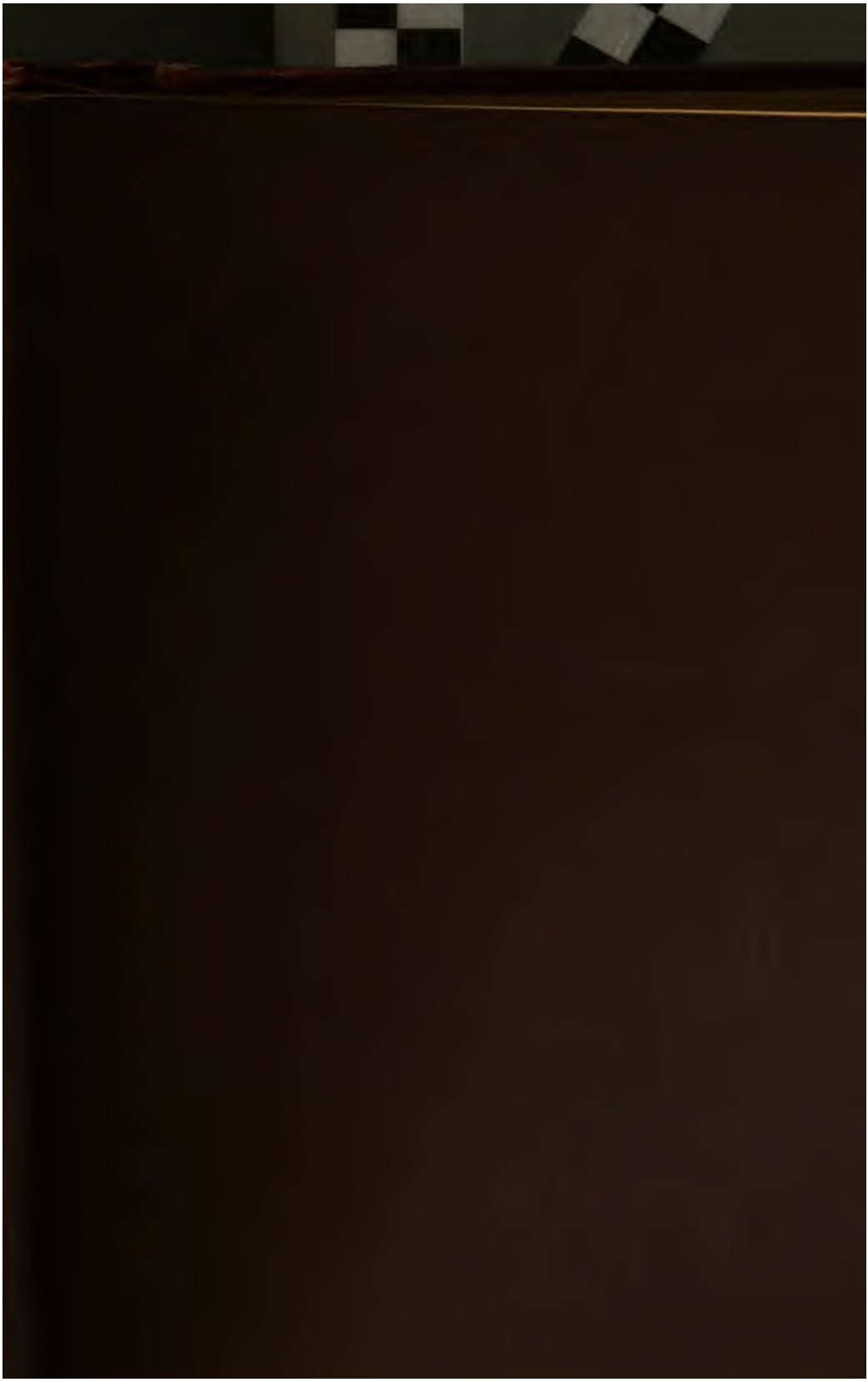

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THE TRANSACTIONS

OF THE

EDINBURGH OBSTETRICAL SOCIETY.

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OF THE

EDINBURGH OBSTETRICAL SOCIETY.

VOL. XIV.

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PREFACE.

THIS, the fourteenth volume of the Society's Transactions, contains a record of its proceedings during the Session 1888–89.

In it, as in former volumes, the views brought forward in the papers are to be considered as those of the writers themselves, and not as those of the Society as a body.

September 1889.

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1886 Keith, Dr Thomas, LL.D., London.
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1882 Parvin, Professor, Philadelphia.
1882 Porro, Professor, Milan.
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1882 Stadtfeldt, Professor, Copenhagen.
1864 Stolz, Professor, Nancy.
1864 Storer, Professor, Boston, U.S.

1882 Tarnier, Professor, Paris.
1882 Thomas, Professor T. G., New York.
1882 Tibone, Professor, Turin.
1876 Turner, Professor Sir W., LL.D., Edinburgh.

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1885 Saunders, Mr F. A., Denburn, Crail.
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1886 Wood, Dr Thomas, 55 Ferry Road.
1887 Wright, Dr W. F., 6 Nelson Street.
1879 Wylie, Dr Hamilton, 1 George Place.

1861 Young, Dr James, 14 Ainslie Place.
1859 Young, Dr Peter, 43 Heriot Row.
1871 Young, Dr Peter A., 25 Manor Place.

1850 Ziegler, Dr Wm., 47 George Square.

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TRANSACTIONS

OF THE

EDINBURGH OBSTETRICAL SOCIETY,

FOR SESSION L., 1888-89.

Meeting I.—October 14, 1888.

Dr Underhill, *President, in the Chair.*

I. *Dr Sym* showed a MALIGNANT GROWTH OF THE BLADDER. The age of the patient was 73 from whom this specimen was taken. She was first under the hands of Dr Angus Macdonald about four years ago on account of vesical hæmorrhage. Afterwards she came into Dr Sym's hands, and in August last Dr Halliday Croom, on his behalf, removed some papillomatous growth from the vesical wall. She improved for a time and then fell back; very severe pain came on with excessive hæmorrhage, and she ultimately died in the end of October. The whole posterior wall of the bladder is occupied by a carcinomatous mass, but the ureters and neck of the bladder are not involved. There were no secondary growths to be found, but there are two fibroid growths on the wall of the uterus. Dr Henry Alexis Thomson had examined the specimen, and said that it was one of rapidly growing cancer.

II. *Professor Simpson* showed a FŒTUS which presented a somewhat rare variety of deformity. It is described by teratologists as a phocomelus, and is sometimes considered as a result of intra-uterine rickets, though its causation is not always due to this disease. It is to be noted that all the extremities are deformed, though the exact nature of the deficiency can only be made out by dissection; sometimes one or more of the bones of the limbs are

absent. In this case there is, besides, a deficiency of the frontal bone, and the orbital cavities are thrown widely apart; no doubt on dissection it will be found that there is malformation of the base of the skull. The aspect of the fœtus had changed somewhat in the interval since its birth, but a fair idea of its appearance would be derived from the sketch which had been made soon after delivery. It was borne by a woman who had already given birth to several healthy children, and there was no evident reason why this child should have been malformed. It was a head presentation, but had been delivered by turning. There was, as is so frequent in cases of malformation, a notable amount of hydramnios. There was only one artery in the umbilical cord.

III. *Dr Sinclair* showed, by kind permission of Mr Symington, specimen of HYDROMETRA. This was taken from a woman aged 55 years. She had been a lunatic for the last 30 years, and died of purpura. Dr Sinclair had the opportunity of having her under his observation during the last four years, and no symptoms presented themselves to direct his attention to this condition. Mr Symington's report of the autopsy was as follows:—On dissection of perineum, hymen was well developed. On opening peritoneal cavity, an organ was seen in pelvis resembling the bladder. Two small irregular openings the size of little finger. There were no signs of peritonitis or collection of fluid in peritoneum. Cervix normal, and external os as a small transverse slit. The cervical canal was patent, but at internal os a fold of mucous membrane appeared to cover the opening. The fundus presented the appearance of an ordinarily dilated bladder, and was of the capacity of a pint.

IV. INTRODUCTORY ADDRESS.

By CHARLES E. UNDERHILL, M.B., F.R.C.P. Ed.

GENTLEMEN,—My first duty is the pleasant one of thanking you very heartily for the honour you did me this time last year in electing me your President. It is not an easy task to fill worthily the Chair which has been occupied by so many distinguished obstetricians; and I feel this the more because we are just entering upon the fiftieth session of this Society, and if we follow the many precedents which have been set of late, we shall mark in some special way this landmark in our history.

I do not propose on this occasion to ask you to celebrate our jubilee, but some time in the course of the session we hope to take an opportunity of signalizing the fact that our Society has arrived at the mature age of fifty years. Happily there are still some among us who were present and assisted at the birth of this little stranger, and who have watched over its progress and have lived to see it attain its present state of health and vigour.

Now, old though our subject is, and rooted far back in the past, yet it is ever green, putting forth new branches in every direction, and full of a vigorous, lusty life. "Age doth not wither it, nor custom stale its infinite variety."

For if we glance at the work which was done at our meetings during last session, we see what a wide field was covered, and what excellent work was done in various departments of obstetrics and gynæcology. At our first meeting there was an interesting discussion on a most valuable paper by Dr Hart and the late Dr Carter on the Anatomy of Extrauterine Gestation, when it was conclusively proved, for the first time, that there is a variety of this disease when the fœtal sac is situated entirely without the peritoneum, the original Fallopian tubal pregnancy having developed downwards between the folds of the broad ligament, and pushing the peritoneum and its contents above and in front of it.

Another subject of great importance and comparative novelty came before us at a later meeting, when we discussed the anatomy of the third stage of labour, the discussion being founded on elaborate papers by Dr Hart and Dr Barbour. And it strikes one as a singular fact, showing how easy it is to overlook work which lies at our very feet, that though in every case of labour the separation of the membranes and placenta is a source of anxiety to the obstetrician, the investigation of the exact anatomy of this process should not previously have been attempted, and should still remain a matter for discussion.

Further on we had two statistical papers recording successful operations in the domain of gynæcology. The one by Dr Croom relating fifty consecutive cases of ovariotomy and the removal of uterine appendages, with only one fatal issue; and the other a complete record by Dr Brewis of twelve cases of removal of the uterine appendages, all of whom recovered, while the operations were in other respects, with one exception, entirely successful.

At another meeting we had an opportunity of discussing an important practical subject of the course and management of labour complicated with mitral stenosis, the matter being brought before us in two interesting papers by Dr Hart and Dr Ballantyne, the former dealing more with the practical aspect of the subject, the latter showing us a valuable and interesting series of sphygmographic tracings, which showed in a very graphic way the dangerous effects which the throes of labour produce upon the already damaged heart.

We have to thank Dr Matthews Duncan for calling our attention, in an able and exhaustive paper, to the evil influence exercised by alcoholism on gynæcology and obstetrics, a subject with which, in some of its details, most of us are familiar, but which yet requires much patient observation and research, and Dr Duncan's paper should serve as a useful stimulus towards the more thorough elucidation of the subject.

Among other papers of interest was a learned inquiry by Dr Barbour into the early contributions of anatomy to gynæcology and obstetrics, in which he traced the slow and gradual development of our knowledge of the anatomy of the female generative organs from the dawn of Medicine up to the publication of the great work of William Hunter; and it was curious to note what a large proportion of this knowledge is due to the labours of Scotchmen.

To Dr Foulis we are indebted for a long and elaborate exposition of the cause of head presentations, and particularly of first cranial positions, in which he put forward a new view, founded on considerations relating to the position and mobility of the liver.

In addition to these we had many other papers, some of scientific, some of practical interest; one in which both these interests were combined, by our late president Dr Halliday Croom, who brought before us an interesting contribution to the anatomy and clinical history of incarceration of the retroflected gravid uterus.

We had, moreover, one discussion on the ever-fruitful topic of puerperal fever, in opening which I adduced some cases showing, as I thought, that danger may arise to puerperal women from the atmosphere of the house in which they are confined being poisoned not only by foul emanations from drains, but also by septic influences from chronic pyæmia and malignant disease.

At the last meeting of the session Dr Milne Murray gave us a valuable demonstration of the action of galvanic currents on the tissues, showing us clearly the different effects produced at the positive and negative poles respectively. He pointed out and demonstrated the important fact, that when the positive pole was inserted into a living or lately dead piece of tissue, the structures immediately surrounding the needle were charred, and the general effect was an acid reaction and a constriction or contraction round the needle — this action being confined within a very limited area. When, on the other hand, the negative pole was inserted within the tissue, the effect produced was much more widely spread, the surrounding tissues were loosened and injured, but not immediately destroyed, the reaction at the point of insertion was alkaline, there was a considerable discharge of alkaline fluid, and the hold on the needle was slack and loose. In a word, the electricity at the positive pole killed a very limited amount of tissue immediately, the negative maimed and rendered liable to slough a much more extensive mass of tissue. These observations may help to explain the different effects produced by the employment of electricity in the hands of different persons, and to caution us as to some of the risks which are incurred in the use of strong currents, unless they are guided and controlled by an adequate knowledge of electrical science as well as competent ideas on the pathology of the female generative organs.

And this question of the value of electrical currents as applied to gynæcological practice is one of those points which is at this moment awaiting solution. Are we to look upon it as a great advance in our art, a commanding addition to our powers in dealing with disease, and worthy of the names which support it; or will it have its day and pass away, like so many more of the fashions which have at times prevailed in the history of Medicine, leaving its wreck to float into some back-water while the stream of knowledge flows relentlessly past it? It may be said that electricity was tried, and failed to come into use years ago. That is so, but there are some considerations which lead one to expect a different issue now. That electricity is a powerful agent for good or for evil none can deny: it is powerful just as all medicinal agents which are of any avail are powerful—poisonous if we don't use them aright; dangerous if the dose be too large, or if they be wrongly applied; but capable, in skilled hands and in proper doses, of effecting great and beneficial results.

Moreover, we must not forget that the sciences are advancing, and none more than electrical science; there is more exactness in its methods and appliances, its force is more accurately measured and controlled, and its physiological effects are more clearly defined. The electricity of to-day differs almost as much from that of twenty years ago as the steam-hammer in its time surpassed and overthrew the cumbrous and unwieldy sledge-hammer of the iron foundry.

And while the science of electricity has been advancing in all directions since it was last applied on any large scale to gynæcological purposes, our knowledge of the physiology and pathology of the diseases of women has not stood still. But the advance in the practice of our art has been largely in the direction of Surgery: the abolition of tapping from the treatment of ovarian tumours and the substitution of early removal of them; the removal of the ovaries in certain cases of uterine fibroids; the removal of the uterine appendages for disease; immediate operation in the case of ruptured tubal pregnancy; the operation of Emmett for torn cervix, are all instances of the abiding energy of our surgical operators. These operations have all established themselves as recognised procedures, though not all of them to the extent which their originators demanded.

But when we come to such procedures as removal of the entire uterus for cancer, or still more hysterectomy in the case of bleeding fibroids, we must call a halt. Here we have the crucial question, Is the disease in itself so deadly that it justifies the extreme risk which is incurred in the operation in the hands of the majority of surgeons; and are we not justified in looking elsewhere for a substitute less dangerous, even though it be somewhat less effectual? It is here, of course, that electricity steps in, and promises us in many cases a safe and speedy cure; in all cases

relief, with no great element of danger. I have had no personal experience myself in the application of the agent for this purpose, though I have seen cases in which it has been used; but for my part, I look forward with hope to the time when its true value shall have been gauged, its limitations ascertained, and its dangers—for there are undoubtedly dangers in its incautious and reckless use—have been duly defined. I believe we shall find it a valuable and efficient agent in our work, and in cases mostly where medical and so-called expectant treatment is of no avail, and where the relief offered by Surgery promises to be purchased at too hazardous a rate. Recent observations, too, seem to show a further use for this agent, and to make it probable that the effects produced by a continuous current on the nutrition of parts may be made available for soothing the pain, and softening down and removing these inflammatory lumps and adhesions within the pelvis which are at present the bane of many of our patients and almost the despair of the physician.

These anticipations are, as you know, still *in nubibus*. The results achieved by different observers are still sufficiently discordant, as a glance at the recent debate in the London Obstetrical Society will show. I don't allude to the remarks of those who, like myself, have not tried it, or who tried it years ago, and gave it up in despair, but of those who possess the two essential requisites for success—those, that is, who have made themselves sufficiently acquainted with the methods and manipulations of electrical science, and possess in addition an adequate knowledge of gynæcological medicine. If either of these requisites be wanting, the attempt is a one-sided one, and cannot be expected to succeed.

There is at least this much to be said for the prospects of the present development of the application of electricity to Medicine, that the reception accorded to it resembles that of one of the lasting gains of medical science rather than one of the passing fashions of the day.

For the changes and improvements which make up the history of medical progress may be divided into two classes—the one, the fashions of theory or of practice, which succeed one another with more or less regularity, and leaving something of gain behind them, are eventually lost sight of on the advent of something newer or more taking; in the other class are the great advances of medical science, which remain for ever as part of the great inheritance which we have received from our predecessors, and which are the essential landmarks of our progress. Now, the reception which these two classes have met with respectively at the hands of the profession and the public may be looked upon as an indication of their value. To take the former class—the passing fashions—first. From the natural tendency of all of us to be influenced by novelty, new methods of treatment, such as I refer to, have always a fascination, partly due to their novelty, partly

to the want of success in the other methods; for life is short, and Medicine is not an exact science, and sooner or later every one of us will furnish an unsuccessful case for a physician. But from whatever cause, any new departure which promises great things, especially if it is easy to do and lucrative in its results, is sure to be received with avidity: it is practised everywhere, in season and out of season, in proper cases and in improper cases. It then becomes reduced to a rule of thumb; the successes that were promised so liberally are found to occur but seldom; the good, if there be any good in it, becomes sharply defined and is retained; but the excess has disappeared, the fashion is past, and the method all but abandoned.

Such is the history of many a passing fashion in medical theory and practice; and our own department has had its full share of them. There were the days of speculum and caustic, where every disease a woman could suffer under was ascribed to inflammation or ulceration of the womb, and treated accordingly. Still later, evils of the most portentous kind were believed to arise from deviations from the normal position of the womb, and whole armaments of pessaries of every shape and size were invented, and whole armies of martyrs suffered from their use. What was good and useful in these practices remains with us; the rest has gone the way of all excesses. These and such like are the passing fashions, and they might be multiplied a hundred-fold in all departments of Medicine; and one of their most distinguishing features is the readiness and applause with which they had been at first received and adopted.

On the other hand, we find it to be almost the rule that the great discoveries, which were destined to exercise the widest influence on the science and practice of Medicine, have been received on their first publication with ridicule, abuse, and every form of opposition. When Harvey first put forth to the world his views on the circulation of the blood, he was almost universally condemned, and had to submit to a storm of obloquy which injured his health, and for a time almost annihilated his practice. A similar reception assailed the first efforts of Vesalius to throw off the yoke of centuries and all the weight which the authority of Galen and the ancients had lent to the utterly erroneous views on anatomy which had been current so long; and it was only the patient labour for years of himself and his disciples, which were at last received with general assent, as the true beginning of an accurate anatomy. Again, with what opprobrium and laughter was the priceless discovery of Jenner received on its first promulgation; what a battle had to be fought against the beliefs and prejudices of the public and the profession, before it was recognised as one of the most potent and beneficent weapons ever added to the armoury of the physician! The history of the introduction of chloroform, or, still later, of the application of the antiseptic theory

to practical medicine, surgery, and obstetrics, are but other instances —and there are plenty more—of the difficulty with which great ideas win their way into the ranks of received and accepted practices, and the slow progress which marks their earlier course. And this is more marked, it seems to me, if these new discoveries or theories happen to start from a scientific basis. Men are, or shall I say used to be, so apt to look upon any practical outcome of scientific observation with distrust, as savouring of the theoretical and visionary, and upon science itself as an unsafe guide in dealing with the wants and miseries of everyday life.

And yet, from the first dawn of the revival of learning to the present time, Medicine has, in all its branches, followed in the footsteps of general science, advancing only with its advances, often lagging behind, never one hand's-breadth in front, and very often running away with physical science and applying it to purposes which it could not further, and asking it for explanations which it was not by the nature of things able to give. Take an illustration of my meaning. The first sciences to start into life when the sun of knowledge began to penetrate the gloom of the Dark Ages, were Physics and Mathematics; Medicine at once followed suit, with physical and mechanical explanations of the phenomena of the living body. The application of the principles of mechanics to the education of muscular action and muscular motion, truly mechanical phenomena, were just and appropriate uses of the science; but not content with that, Bellini and his followers extended their reasonings to all the functions and processes of the body in health and disease. The body was simply regarded as a machine irrigated by a system of tubes, and these were measured and calculations formed of their diameters, of the frictions and retardations due to the passage of fluid along them, of the size of the particles and pores; and the whole system was regarded by these Iatro-mathematicians as governed by the then known laws of mechanics.

Chemistry, again, which in the hands of the alchemists had lived a precarious and inconspicuous life through the centuries of darkness, had no sooner shaken off the traditions of the past and entered upon its true career as a science, than its influence at once reacted upon Medicine. New theories of vital action in health and disease, based upon chemical reactions, at once came into vogue, notably the view held by Willis and Sylvius, that all the phenomena of health and disease depended on various fermentations, which took place in the blood and other fluids and solids; and that each organ and fluid had its own particular ferments, and that a morbid state of these ferments was the cause of all diseases, and upon these views was based the medical practice of the day. Indeed, step by step the advances and discoveries of the chemist have been followed and utilized by the anatomist, the physiologist, and the physician. How much do we not owe to the

simple discovery of the composition of the atmosphere, with all the momentous consequences which have flowed from it, to physiology of respiration and the practice of Medicine! And from the day of that discovery to this, new compounds, new salts, new alkaloids, new products of synthesis in the laboratory have been continually added to our armoury, to say nothing of what the practice of Medicine owes, through the medium of physiology and pharmacology, to the light which chemical science has thrown on the constitution of every tissue and fluid and solid in the human body.

I need not remind you how botanical science has given us new drugs, and therapeutics has shown us how to use them; and I say nothing of our debt to anatomy and physiology, because they are part and parcel of the science of Medicine, which, without their guidance is, and always has been, little better than a series of guesses, like shooting at a mark in the darkness, an arrow now and again hit the mark, but the great majority went far astray.

In fact, the whole of medical practice from beginning to end rests upon the foundation of the other sciences: physics and mathematics form the broad basis; chemistry, anatomy, physiology, and botany form tiers in the structure; and if we could at this time of day remove entirely any one of these, the whole structure would come crumbling about our ears.

And if Medicine in general owes everything to science, obstetrics in particular is not behindhand in acknowledging its share of the obligation. From the simple mechanical principles which underlie the construction of the pelvis and direct our conduct in the management of labour, up to the latest advances of biology—that greatest of all sciences, because it embraces them all—there is none which we do not draw upon in some way or other. Indeed, as has been often said, but it cannot be repeated too often, the greatest advance in the obstetrics of our time, or perhaps of any time—I refer, of course, to the application of the principles of antiseptics to the practice of midwifery—is the direct outcome of the researches in the domains of biological science of two men, Pasteur and Lister, men who never practised midwifery in their lives: "other men have laboured, and we have entered into their labours."

But it is time I was drawing these desultory remarks to a close. I have strayed a long way from the consideration of the question, now so prominent, of the application of electricity to practical gynæcology; but I would say in conclusion, that the caution and scepticism, and in some hands the ridicule, with which these practices have been received, is to my mind an argument in their favour; because, as a matter of general experience in Medicine, those so-called advances which have been received on their first promulgation with the greatest enthusiasm, and have been practised with the greatest energy, have too often been found in

the long run to be of little real value, and have eventually fallen into merited oblivion. They have gone up like the rocket and come down like the stick. Nothing of real greatness and utility can come in Medicine, or anywhere else, without time and labour, and the healthful, strengthening influence of free discussion and plenty of abuse.

Professor Simpson proposed a cordial vote of thanks to the President for his able address.

V. A CASE OF RUPTURE OF THE UTERUS.

By A. A. Matheson, M.D.

Mr President and Gentlemen,—It has seemed to me that the report of this case might not be uninteresting, inasmuch as the rupture was produced mechanically, and the patient survived the accident for nearly a fortnight. There are also, I believe, some other points of interest in the case.

I first saw the patient in her tenth labour; the previous nine had all been easy. Pains had existed for nineteen hours, but had been very feeble and irregular. One hour before my arrival the membranes had been ruptured, and the forceps applied, without, however, bringing about any advance of the presenting part. On my making a vaginal examination, a brow presentation was felt, the occiput lying to the left side of the pelvis, and somewhat anteriorly. Since the child was living, and the membranes had been ruptured but one hour previously, and since the head was not engaged in the brim, it was considered that podalic version was the best treatment to be adopted. The patient having been deeply chloroformed, no difficulty was experienced in bringing down a foot into the vagina, the body of the child, however, did not revolve, the head remaining at the brim of the pelvis. Gentle and cautious pressure upwards on the head was then combined with traction upon the lower extremity, assistance being rendered at the same time by abdominal pressure, and version was completed. Unfortunately the child was still-born, some delay having occurred in the birth of the head, which was above the average size.

It was noticed that as the head escaped from the vulva, several large blood-clots immediately followed. Severe hæmorrhage ensued directly afterwards, for which friction of the uterus through the abdominal walls was employed, ergotin injected subcutaneously, and a hot water intrauterine injection administered. While removing the afterbirth and using the hot water (which soon controlled the hæmorrhage), it was noticed that a tear existed in the uterine wall to the left side, and somewhat anteriorly. The tear extended from what seemed to be the contraction ring, directly upwards, to not far from the fundus. From the tonic

contraction of the uterine muscular fibres, the edges of the rent had retracted, leaving a wide gap into which a large part of the hand easily passed. Though the rupture involved the entire thickness of the muscular wall, the peritoneal covering was felt to be intact.

Shortly before the birth of the child, the patient's pulse was fairly good; after the hæmorrhage occurred, and for two hours afterwards, no pulse whatever could be perceived at the wrist, and the patient presented the typical symptoms of profuse hæmorrhage. Stimulants were administered by the mouth and subcutaneously, and a nutritive enema was given.

Twelve hours after delivery the general condition of the patient had much improved. The pulse was 130, very weak and compressible; temperature normal. She complained of somewhat severe pain and tenderness in the left iliac region. Extensive dulness on percussion, believed to be due to sub-peritoneal hæmorrhage, existed in the left iliac region, and to a less degree on the right side.

The subsequent progress of the case was as follows:—The pulse got slightly but perceptibly stronger for the first few days, but afterwards remained of much the same strength, the rate varying from 108 to 126. The temperature continued normal, except on the fourth and fifth days, when it rose to 101° and 101°·6 F. respectively. The pain and tenderness on the left side diminished greatly by the end of the first week, and were almost gone shortly before death. The dulness in the right iliac region disappeared in a few days, that on the left side in a week. On the fifth day, patient had a severe attack of vomiting, lasting some hours, during which nothing would remain in the stomach; these attacks kept recurring at intervals, greatly interfering with her acquisition of strength. From the time of delivery onwards, some slight difficulty of breathing was complained of, but more severe attacks of dyspnœa occurred at intervals for a few days before death; in one of these attacks she sank, having lived thirteen and a half days after parturition. The treatment employed during the puerperium was perfect rest, and the administration of stimulants with light nutritious food. Vaginal antiseptic douches were employed a few times on account of some slight fœtor of the lochial discharge.

A post-mortem examination was performed twenty-six hours after death by Dr Wm. Keiller. No trace of peritonitis was found, with the exception of a few exceedingly trifling recent adhesions of the great omentum to the side of the abdominal cavity. The stomach and intestines were somewhat distended. A layer of blood was seen under the peritoneum which covers the posterior abdominal wall, extending from the brim of the pelvis as high up as the diaphragm. Blood was also seen in small amount in both broad ligaments, in the utero-sacral ligaments, behind the rectum, and beneath the portion of peritoneum which

passes from the uterus to the bladder. The left broad ligament was quite entire but somewhat softened, perhaps from post-mortem changes, so that it was easily ruptured accidentally by the finger, which then at once passed directly into the uterine cavity. The tear in the uterine muscular wall is seen in the specimen I now show. In connexion with the examination of the thoracic organs, an ante-mortem clot was found in the pulmonary artery, extending into its small branches. I believe the immediate cause of death, therefore, to have been thrombosis of the pulmonary artery, which had been induced by the weak and exhausted state into which the patient had been brought by the post-partum hæmorrhage and the severe attacks of vomiting from which she had suffered. In this way are accounted for the attacks of dyspnœa occurring before death.

The above case appears to me worthy of being placed on record for several reasons. In the first place, it is but seldom that cases of rupture of the uterus due to mechanical injury during obstetrical operations are reported, it is rather that variety in which rupture occurs spontaneously in a labour prolonged from some obstruction. I feel certain that in my case no undue violence was employed; and I have therefore been led to the conclusion, that unless the fœtus is very freely movable within the uterus, podalic version is much more dangerous in cases in which the brow, and especially the face, presents, than in those where we have the vertex presenting, and that for this reason,—In vertex cases the occiput and back of the child form one continuous curve—they form, as it were, part of a perfect ovoid, and thus the fœtus can easily be made to revolve on its axis. In face and brow presentations, on the other hand, the body of the child lies so much inclined to the surface of the uterus, and at such an angle with the head, that any attempt to cause the child to revolve on its transverse axis by drawing on its lower extremities will tend, in the first place, to bring about flexion of the head and approximation of the back of the child to the uterine wall. The result will be that the occiput acting as a fulcrum, marked pressure by it in an outward direction will be exercised on the uterine wall, and rupture will be liable to occur.

I would wish also to draw attention to the retraction of the edges of the tear which existed after delivery. For Lusk states that the uterine opening in such cases has a tendency to speedily close.

The third and last point I think worthy of notice is that from the time of the accident until death occurred, peritoneum only intervened between the peritoneal and uterine cavities, and peritonitis was not set up, though the uterus contained septic material. Would it not then be of advantage, when bringing together the edges of the wound made in the uterine wall in Cæsarean section, to stitch the peritoneum and muscular tissue separately, the peritoneum having been first stripped or dissected off to some slight extent from the muscular tissue beneath. By this method

we could hope for a rapid union of the edges of peritoneum, and there would be formed a barrier between the uterine and peritoneal cavities, if, as is so apt to happen, the wound in the muscular wall were to gape, and in the case I have just reported, such a condition existed for nearly a fortnight without any detriment to the patient.

Professor Simpson thought the Society were indebted to Dr Matheson for his interesting record of this case of rupture of the uterus. On looking at the preparation, it illustrated well the tendency of the rupture to take place in the lower segment of the uterus. For though the lower part of the Bandl ring had been involved in the laceration, the rent ran mainly below this, and ran not merely perpendicularly but also transversely, so that in the anterior wall of the uterus the lower segment was torn through nearly half way to the right side. Bandl had shown that face presentations were among the conditions that rendered the uterus liable to this accident under its own efforts, and Dr Matheson's case showed how, in the effort to turn, it might be brought about artificially. Such a case would lead us to believe that where forceps fail to extract the child after the lower uterine segment has become markedly thinned, it will be safest for the mother to deliver by embryulcia.

Dr Freeland Barbour said that the seat of the rupture in this case was of special interest with regard to the disposition of the peritoneum on the pregnant uterus. Although the tear extended into the front wall, it was chiefly lateral—that is, over a part of the wall which was not covered with peritoneum. In the sections which he made of a case from the first stage of labour, the fact which struck him most was the absence of peritoneum at the sides of the uterus within the pelvis; while the peritoneum in front and behind of the uterus retained at the end of the pregnancy the relations of the non-pregnant condition, that at the sides was lifted up by the growing organ so as not to descend below the brim. They had thus a portion of uterus which was embraced by cellular tissue only, and if the tear took place over this area, it went into cellular tissue. They had thus a satisfactory explanation of so-called incomplete rupture, and one which was more intelligible than that a tear should go through the muscular wall and stop short at the delicate peritoneum.

The President said this case illustrated the risks which were inherent to the operation of turning; they might perform the operation ninety-nine times out of a hundred without any incident to cause them anxiety. And then came a case where some untoward accident happened—an accident which might have occurred spontaneously. The tear seemed to have taken place in the usual position, and the direction of the rent to have been nearly transverse. These accidents were not always fatal. He had once to induce prema-

ture labour in a patient who, in her previous labour, had had a large tear in the uterus or vagina, so bad that coils of intestine had come down into the vagina. She recovered, however, on both occasions without any bad symptoms. The Society were much indebted to Dr Matheson for bringing forward such an interesting subject for discussion.

Dr Helme said the Society's thanks were due to Dr Matheson for so fully reporting this case. It illustrated one of the risks of the operation of turning after labour had been going on for some time, and the lower uterine segment had become drawn out and thinned to an unusual degree. The danger of rupture of the uterus is not to be dreaded before this stage is reached. It was surprising what amount of force might be employed within the uterus without injury when there was no morbid thinning of the lower segment. The risks in the earlier stage might be rather on the part of the fœtus; for he remembered two cases of turning which occurred in the Obstetrical Klinik in Strassburg during his stay there, and in which the vertebral column of the fœtus had been completely fractured without evident injury to the maternal structures. He mentioned this to point out the amount of force it was possible, though by no means advisable, to employ within the uterus without rupturing it when there was no excessive thinning of the lower segment. In Dr Matheson's case it seemed to him that the rupture was to be explained neither by the abnormal presentation nor by any undue force employed, but by the morbid thinning out of the lower segment.

Dr Matheson quite agreed with Prof. Simpson's remarks as to the situation of the rupture in the specimen before the Society, but would remind him that the description in his paper was a clinical one—it described the rupture as felt by the hand within the uterus immediately after delivery, when strong retraction of the uterine muscle existed. The fact that there was no reason to suspect any unusual thinning of the lower uterine segment, and the fact of the child being alive, decided in favour of version as contrasted with embryulcia. Dr Barbour's explanation of the non-rupture of the peritoneal covering was very true, and was well seen when the post-mortem examination was being made.

VI. THE PHYSIOLOGY OF THE THIRD STAGE OF LABOUR: A CLINICAL CONTRIBUTION.

By T. Arthur Helme, M.B., Physician to the Women's Dispensary, Edinburgh; formerly Buchanan Scholar and Clinical Assistant in the Gynecological Department, Royal Infirmary, Edinburgh.

The following account of a labour, which I have the honour of presenting to the Fellows of this Society, possesses a special

interest, inasmuch as its facts seem to have a clear bearing on the now much-debated question of the Separation of the Placenta. In regard to this we have at present two main ideas, the one directly opposed to the other: according to those who hold by the one, the placenta is separated during the time when the area of the uterine wall is becoming smaller; while according to those who hold by the other, the placenta is separated during the time when the area of the uterine wall is becoming larger. The following case (in addition to other points of interest) presented an almost unique opportunity for observing the clinical aspect of this question, and it is to this portion of the history—dealing with the Third Stage—that I would particularly draw attention.

I was asked by Dr M'Call, to whose kindness I am indebted for the following particulars, to see Mrs T., aged 35, an viii.-para. Labour had set in early in the day, but pains continued very slight till nearly 5 o'clock. The child was born at 5.15 P.M., the doctor arriving immediately thereafter. Finding the abdomen still of large size, he examined the patient, and found the os cervicis occupied by a bag of membranes, but no part of a fœtus was palpable, nor were any heart-sounds audible with the stethoscope. At 7 o'clock, as pains did not return, I was asked to see the patient. On examination the following condition presented itself:—Abdomen immensely distended and almost globular, the superficial veins very striking. The size of the abdomen would have been remarkable even in an ordinary single pregnancy, and of its appearance before the expulsion of the first child it would be difficult to form any conception. On palpation the walls of the abdomen were exceedingly tense and elastic; the uterus could not be recognised as a distinct sac, and no fœtal parts could be felt within; while on percussion a fluid thrill was most markedly given as one is accustomed to feel it in an ovarian cyst, showing the extreme distension and thinness of the uterine wall. Auscultation revealed no fœtal heart.

Per vaginam, the cervix was widely dilated, the bag of membranes presenting; on pushing this upwards, while the patient was lying on her back or side, no fœtus could be felt, but on placing her in a half-sitting posture, one felt a small hard body, resembling a knee, fall upon the examining finger, immediately receding on exercising the slightest pressure from below. There was evidently a very considerable amount of liquor amnii. As two hours and a half had elapsed since the birth of the first child (and no placenta had escaped), I ruptured the membranes, and after the escape of a large quantity of fluid, I passed my hand away up into the uterus, and found that, situated on the dorsum of the child in the cervical region there was a cystic body, very thin walled, and about the size of a large orange, evidently a spina bifida. It was impossible to deliver the head and this together

safely, and during its passage through the pelvis, the thin cyst wall ruptured. The cord, in which no pulsation could be detected by the time the child was delivered, was ligatured and divided. (Two ligatures were used, and the cord divided between them.) No inspiration was made by the child, though movements of the lips occurred, and after the cord had been cut, a few feeble trials were attempted, though never sufficiently deep to draw air into the chest.

The fundus of the uterus was grasped by the hand, but retraction was very slight, probably owing to the previous over-distension, and contractions were almost absent—in fact, the uterus remained in a flabby condition, feeling like a piece of bowel rather than anything else. By steady kneading and friction (owing to the now laxness of the abdominal walls, one had perfect control over the uterus) an occasional contraction was called forth, the uterus making a fairly respectable imitation cricket or preferably football, to be again succeeded by a rapid relaxation of the uterine wall, so that the fundus reached above the umbilicus, about half-way between it and the xiphoid cartilage. This went on for half an hour with slight hæmorrhage. As the latter seemed to become rather freer, eight minims of ergotinin were injected hypodermically, and a vaginal douche of hot water administered, but this only called forth a weak response on the part of the uterus; the hæmorrhage, however, was reduced. On passing my fingers into the interior of the uterus, both placentæ were found to be still attached to the uterine wall; I therefore grasped the uterus externally between my hands, and gently compressed it; this provoked a strong contraction, the uterus becoming firm, and as it was felt becoming smaller and smaller, the patient called out that something was coming away—it was a placenta which had separated while my hands were grasping the uterus; it escaped into the vagina, whence it was expressed, being born edge first, and folded as Matthews Duncan has described. This was the placenta belonging to the child last born. The uterus immediately again became flabby, reaching up above the umbilicus; and now bleeding had become more active—instead of a faint dribbling it began to trickle away. On passing the hand into the interior of the uterus I found that partial separation had taken place, the placenta being detached at its lower extremity. By kneading and pressure one or two very faint contractions were aroused, followed by full relaxation, the uterus extending up above the umbilicus, and feeling like a piece of bowel in which the blood could be felt crackling. I decided to prevent any further loss of blood by removing this second placenta by the hand. This was done without any difficulty, the placenta leaving the uterine wall easily and cleanly: the points that struck me most forcibly being the extreme tenuity of the uterine wall—it seemed to be like two or three sheets of writing paper between the fingers of the two hands

—and the looseness of the placental attachment to the uterine wall.

I have reported this case fully because of its not uninteresting relation to the important subject of the phenomena of the Third Stage. Of late this subject has been prominently brought under the notice of this Society in its anatomical and purely physiological aspects, but clinical observations are much needed, for, although anatomical study will, and must, take a necessarily important part in helping to build up the foundation of its explanation, it is to clinical study that the chief part belongs; with it, indeed, lies the final accepting or rejecting of the results obtained by other methods, according as they agree or disagree with clinical experience.

Dr Berry Hart has lately propounded an entirely novel view of these phenomena; he suggests that the separation of the placenta is brought about, not, as usually supposed, by the diminution in area of the uterine wall, but by an increase, *i.e.*, the placenta separates during relaxation of the uterus, not during its contraction. Hart's words are:—"Placenta and membranes separate when there is a disproportion at the plane of separation between their area and their site of attachment. This disproportion is only slight, as the trabeculæ are microscopic. This disproportion happens during the Third Stage in the relaxation following a pain, and, therefore, separation occurs after the pain. The gist of the view advocated is that the placenta separates in the Third Stage after the pains, and is expelled, when separated, by the pains."[1]

The facts of the case above related bearing on this problem may be thus summarized:—

1. Here is a uterus at the conclusion of the Second Stage containing two placentæ, both attached to the uterine wall.

2. Placenta No. 1 is that belonging to the first child, born three and a half hours before the second child. The first child breathed and cried loudly before its cord was ligatured, so that all conditions were fulfilled to make this placenta what Dr Hart calls "practically a bloodless structure." On Dr Hart's relaxation theory, therefore, this placenta is *favourably* placed for separation.

3. Placenta No. 2 is that of the second born child. This child did not breathe before the cord was tied, so that the placenta was not aspirated, hence its fœtal half is not a "bloodless structure," and on Hart's theory this placenta is *unfavourably* placed for separation.

4. While contractions and retraction were only slight, relaxation was extreme, the fundus receding to a point above the umbilicus after expulsion of the second child.

Here, then, is a relaxed uterus, containing on the one hand Hart's bloodless placenta, and on the other hand a bloodful placenta. If the uterus could be made to contract and relax, we should naturally expect the aspirated placenta to separate first.

[1] "On the Third Stage of Labour," *Edin. Med. Journ.*, Oct. 1888.

But what really happens? In the first place neither placenta is separated during relaxation; and afterwards *that* placenta is the first to separate whose fœtal blood has *not* been aspirated; while the other placenta remains attached to the uterus, though its blood has been aspirated.

But, further, as to the time and method of separation. The placenta which came away first (namely, that belonging to the second child), was *separated not during relaxation, but during a pain.* During the relaxed condition of the uterus, I ascertained, by passing my hand into the uterus, that both placentæ were attached (No. 1, the larger, over the posterior, right, and upper portion of the uterus, extending over the fundus; No. 2, the smaller, to the left and front and below); and after one or two slight contractions, brought about by kneading and friction, with subsequent extreme relaxation, on renewed examination, I again found *both placentæ* still attached to the uterine wall. It was immediately after this last examination that I compressed the uterus (gently, not violently), and was relieved to feel a response, the uterus becoming firmer or harder—in fact, contracting well, and then suddenly becoming smaller, a placental mass being extruded with its lower edge first. There was no doubt at all that this placenta No. 2 separated during a genuine uterine contraction, brought about by a stimulus applied externally. It was not artifically driven out, nor forcibly torn away, but separated naturally during a uterine pain.

After this the uterus again became distended, so that the fundus came to be at a higher level than the umbilicus, and yet this extreme relaxation did not detach the remaining placenta though it was "practically bloodless."

Stimulation had the effect of setting up one or two slight contractions, but neither these nor the subsequent relaxations detached the placenta. It was therefore artificially detached; separation presented no difficulty; there was no special bleeding (in fact, circulation seemed to have almost stopped in the maternal as well as fœtal part of placenta), nor were there any points of morbid adhesion, the finger passing along the plane of separation between the layers almost as easily as through butter. Its complete non-separation seemed to me to be entirely owing to want of uterine contractions. The points then that these observations show are that—

1. Of the two placentæ, that whose fœtal blood was not aspirated was separated and expelled, while the placenta whose fœtal blood had been fully aspirated was not separated.

2. With regard to the placenta spontaneously detached, its separation occurred during a pain, after complete relaxation had failed to detach it.

3. With regard to the placenta artificially detached, complete relaxation of uterus failed to detach it, and, owing to the non-occurrence of contraction, it remained unseparated.

These facts may be shown as follows:—

Non-aspirated Placenta.	Aspirated Placenta.
Was spontaneously detached. Relaxation failed. Contraction succeeded.	Was not spontaneously detached. Relaxation failed. Contraction separated lower border and then was absent.

Appendix.

The question may be raised, Why the placenta of the first child did not separate along with the placenta of the second child, since they were subjected to the same contraction? It seems to me that there were three factors which influenced this—

1. *The Mass in the Uterus.*—When both placentæ were present there was a large mass on which the weak uterine power could act. This power was not able to separate both. It separated the one and not the other, because of 2 and 3.

2. *The Condition of the Bloodvessels.*—The one placenta was emptied of blood, and the other full of blood. As the uterus becomes smaller, a placenta full of blood will not follow the diminution in area of its site to the same degree as a placenta which contained little or no blood, and so will come to be stripped of.

3. *The Relative Positions of the Two Placentæ.*—That situated lowermost separated first. During separation it has been noted that the placenta in some cases is detached first at its lower margin,[1] so here the placenta situated lowermost was first separated.

Another question arises as to whether there was any morbid adhesion of the last separated placenta. I think certainly not, on the following grounds:—1. No adhesions were felt; 2. The separated placenta had a normal and healthy appearance; 3. The child was healthy, and born at full time; 4. The other placenta was healthy, and separated of itself, and what reason is there that this uterus should develop in its interior a healthy and an unhealthy placenta at the same time? 5. The placenta was partially separated at its lower margin, and if the contractions had been powerful enough it would probably have been entirely separated.

But the essential point is that relaxation failed to separate both the placentæ, so that, even if the second placenta were "adherent," the fact still remains that *relaxation failed to detach the first.*

[1] "The Third Stage of Labour: A Criticism of papers by Cohn, Champneys, and Berry Hart," by A. H. F. Barbour, M.A., M.D., F.R.C.P.E., *Ed. Med. Jour.*, August 1888.

Professor Simpson regretted that Dr Hart had not been able to be present to give us the benefit of his criticism of the case which Dr Helme had laid before the Society. He (Prof. Simpson) had expressed himself adversely to Dr Hart's explanation of the mode of separation of the placenta when the subject was under discussion before, and his belief that the placenta was detached during uterine activity was greatly confirmed by the lucid exposition which Dr Helme had made of his interesting case. Only he would call attention to the circumstance that the placenta first expelled was that which lay lowest in the uterus, which was what might be anticipated whatever theory might be entertained as to the conditions under which detachment is effected.

Dr Foulis said he agreed with Prof. Simpson that it was unfortunate Dr Hart was not present, as it was hardly possible to make any remarks on Dr Helme's interesting paper without strongly criticising Dr Hart's recently published views on the separation of the placenta. If Dr Hart's theory as to the separation of the placenta was correct, they should be obliged to admit that the relaxation of the uterine wall which separated the placenta was an active, forcible one. Was such a relaxation due to elasticity or to resilience, or to contraction of the uterine muscular wall? Dr Hart denied that the placenta was separated during the pains—that is, during the contractions. He says, "the placenta is separated in the third stage *after* the pains," and yet, strange to say, he directs us "when the child is born to give an ergotine injection in a multipara, at any rate, if the labour has been slow." From what they knew of the action of ergotin, one would have thought that this above all things should not have been given if the separation of the placenta took place during the relaxation and not during the "pains" of the uterus. That the elongated muscular fibres shorten and contract in one way during the powerful contractions of the uterine wall was quite certain, but that they forcibly elongate or contract in another way during relaxation of the uterine wall was not only not proven, but was against all the known laws of physiology. What was the force that produced this so-called relaxation of the uterine wall after the contraction was over? He believed that this act of relaxation was entirely passive, and that it was caused entirely by the filling and distension of the sinuses and vascular channels in the wall of the uterus, by blood poured into them by the contractions of the left ventricle of the heart, as soon as the contractions of the uterus itself were over. This vascular engorgement and consequent relaxation of the uterine muscular wall went on until the latter was stimulated to contract again. The act of relaxation was, comparatively speaking, a slow one, while the act of contraction was much quicker and many times more powerful than the act of relaxation. It seemed to him that the powerful contractions of the uterus fully explained the separation of the placenta. After the child was born, the uterine wall continually diminishes in size, and the area of its placental

attachment must be greatly reduced; but while this was taking place, the size of the placenta was but slightly reduced, therefore the one must be separated or torn from the other. He knew nothing more beautiful in physiology than the free circulation of the blood around the chorionic villi as they hung free in the placental sinuses. When contractions of the uterus tear through the attachment between the chorionic villi and the sinuses, the blood in the sinuses begins to coagulate, and also in the corresponding parts of the placenta. As this coagulation takes place throughout the substance of the placenta, it gradually becomes harder and more resistent in its substance, and thus facilitates its own separation from the uterus. Dr Helme's paper was a valuable one, and he was to be congratulated on its excellence.

Dr Craig said he entirely corroborated all that had been said in praise of this communication. His clinical experience, now extending over twenty years, had led him to the same conclusion as that arrived at by Dr Helme. His universal practice was to grasp firmly with the left hand the uterus through the abdomen during the completion of the second stage of labour. And after the birth of the child, he causes the nurse to grasp tightly the contracted uterus, and to hold it till after the tying of the cord and separation of the child. Afterwards he seizes the contracted uterus and retains hold of it till after the completion of the third stage of labour. By this simple method the placenta in 49 cases out of every 50 was removed within five minutes of the birth of the child. He has never lost a case from *post-partum* hæmorrhage. In fact, he believes that this treatment helps to separate the placenta and to throw it into the vagina, and tends in no small degree to prevent *post-partum* hæmorrhage.

Dr Freeland Barbour said the difficult point to understand in Dr Helme's extremely interesting case was why the second placenta was not detached. It may have been because, being aspirated, its bulk was smaller, and so did not present so large a mass for the uterus to act on. Its attachment also over the fundus may have had something to do with it; when the placenta is on one wall it will slip down more easily, and the detachment and slipping down go on together.

Dr Thos. Wood said they were greatly indebted to Dr Helme for his able and highly instructive paper. It contributes greatly to the elucidation of this much discussed question of how the placenta separates, and clearly, he thought, shows that in this case, at least, separation was not brought about by the relaxation, but by the contraction of the uterine muscular fibres. The following case which occurred in his practice some time ago, and which had some bearing on this subject, he thought worth relating. Mrs H., aged 29, multipara, seven months pregnant, was taken in labour. Just as he arrived at the house, and before he had seen the patient, a severe pain came on, the result being that the fœtus was born contained

in the membranes which were unruptured, the whole thing coming away with the one pain. The child on being extricated was alive, and lived for a fortnight. On examination of the placenta there was no blood-clot on its maternal aspect or evidence of bleeding such as one would have expected to get had there been any separation during the uterine relaxation preceding the last contraction. It would thus seem that the last pain or contraction was the cause of both separation and expulsion.

The President thought Dr Helme's paper an admirable one, and he regretted Dr Hart's absence. It was fortunate the case had fallen into the hands of one who was so competent to observe exactly the course of events, and to reason so carefully upon them. He believed that the uterus shed the placenta in consequence of its great contraction, the lessened placental surface in the uterus separating from the placenta, which, when pretty full of blood, was practically non-compressible.

Dr Felkin said he had heard Dr Helme's paper with great interest, as it fully confirmed the view he took with regard to the expulsion of the placenta. Observation of parturient women in uncivilized countries had convinced Dr Felkin that most of their accidents in child-bearing were due to the retention of the placenta, and he had noticed that in those tribes where the cord was either bitten or cut through with a blunt instrument, the retained placenta less frequently occurred than when it was cut with a sharp knife and not tied.

Dr Helme thanked the Society for the exceedingly kind manner in which his paper had been received. He also regretted Dr Hart's absence. Dr Foulis had raised an important question as to the power of active dilatation, and Dr Helme was inclined to agree with him in ascribing a very important part to the blood circulation. In reply to Dr Barbour's question, Why the placenta of the first child did not separate along with the placenta of the second child, since they were subjected to the same contraction, there were three factors which influenced this:—1. *The Mass in the Uterus.*—When both placentæ were present there was a large mass on which the weak uterine power could act. This power was not able to separate both. It separated the one and not the other because of 2 and 3. 2. *The Condition of the Bloodvessels.*—The one placenta was emptied of blood and the other full of blood. As the uterus becomes smaller, a placenta full of blood will not follow the diminution in area of its site to the same degree as a placenta which contained little or no blood, and so will come to be stripped off. He agreed with Dr Felkin on this subject. 3. *The Relative Positions of the Two Placentæ.*—The third factor was the relative position of the two placentæ, or that situated lowermost separated first. During separation the placenta first begins to be detached at its lower margin, so here the placenta situated lowermost was first separated. With regard to Dr Barbour's other question as to whether there was any morbid adhesion of the last placenta, he thought certainly not on these

grounds—1. No adhesions were felt; 2. The separated placenta had a normal healthy appearance; 3. The child was healthy, and born at full time; 4. The other placenta was healthy and separated of itself, and what reason was there that the uterus should develop in its interior a healthy and an unhealthy placenta at the same time? 5. The placenta was partially separated at its lower margin, and if the contraction had been powerful enough it would probably have been entirely separated. But the essential point is that relaxation failed to separate both the placentæ, so that, even if the second placenta were "adherent," the fact still remains that *relaxation failed to detach the first.*

MEETING II.—DECEMBER 12, 1888.

DR UNDERHILL, *President, in the Chair.*

I. *Prof. Simpson* showed a HYDROCEPHALOUS FŒTUS.

II. *Dr Matheson* showed two well-marked examples of the ANENCEPHALOUS FŒTUS. The history of the labour was very similar in both cases: hydramnios was present, the base of the cranium presented, and uterine inertia existed from the first, so that delivery had to be effected in the one case by manual assistance, in the other by the use of the forceps. The deformity is described as being caused by intrauterine hydrocephalus, which is so excessive that the pressure of the fluid causes the brain substance and cranial vault to atrophy and disappear; finally, the membranes of the brain rupture, the fluid escapes, and nothing is left but a small mass of connective tissue covered by the collapsed membranes. In both fœtuses shown a similar condition affects the spinal column: its posterior part and the spinal cord are absent, while the membranes are present. Very frequently such children have other deformities and defects of development. Thus in the specimens before the Society, hare-lip, cleft palate, club-foot, and other deformities are seen.

III. *Dr Milne Murray* showed a PLACENTA WITH VELAMENTOUS INSERTION OF THE CORD. The cord entered the membranes about 3 inches from the margin, and from this point three large branches pass on to the fœtal surface. The labour was normal in every way.

IV. *Dr Halliday Croom* showed—1. Two large POLYCYSTIC OVARIAN TUMOURS removed from the same patient. The first was so adherent to bowel, and the pedicle so hard and thick, that it was found impossible to secure otherwise than extra-peritoneally. The second was easily enough removed by Staffordshire knot. From the enormous amount of ascites, and the condition of the peri-

toneum as well as the extreme vascularity and friability of the tumours, they were at the time of removal thought to be malignant. Microscopic examination has not confirmed this. The patient is doing well. 2. OVARIES and TUBES from a case of acute gonorrhœal salpingo-oophoritis. The patient was a prostitute from the Lock Hospital, and had suffered for years; the present attack was comparatively recent. The tubes were thickened, but not dilated. There was no pus. 3. A case of well-marked HYDROSALPINX; on removal about the size of a large orange. 4. Two pairs of APPENDAGES, removed in two cases of small bleeding fibroids. 5. A simple OVARIAN TUMOUR, with a large hæmatocele of ovary on opposite side.

V. A CONTRIBUTION TO THE PATHOLOGY, SYMPTOMS, AND TREATMENT OF ADHERENT PLACENTA.

By D. BERRY HART, M.D., F.R.C.P.E., F.R.S.E., Lecturer on Midwifery and Diseases of Women, Surgeons' Hall, Edinburgh; Assistant Obstetric Physician, Royal Maternity and Simpson Memorial Hospital, Edinburgh; Assistant Gynæcological Physician, Royal Infirmary.

FEW complications of the third stage are more disliked by the obstetrician than adherent placenta. While not now the bugbear it was in former times, yet the risks of hæmorrhage and septic mischief make it still formidable, although, fortunately, the latter complication is rare and thoroughly preventible. We are not yet in a position to explain the pathology of this complication. Indeed, to do so in any instance would require such an extended knowledge of the case before conception and after labour as must necessarily be rare. I believe that obstetricians are to blame in not more thoroughly examining the shed placentæ in adherent cases, although it may be urged that the mischief is probably in the spongy layer and next the external wall. Granting even this, we do not as yet know the microscopic anatomy of such cases as we ought.

My attention has been directed to this subject from my very good fortune in obtaining a remarkable specimen of an inverted third stage uterus with the placenta adherent. As the microscopical anatomy of the specimen is interesting, and seems to me to partially explain such a complication, I have brought it before your notice to-night along with some remarks on its clinical aspects.

In examining this specimen, I did so by making microscopical sections of the entire thickness of the uterine wall and placenta by the celloidin process, so as to ascertain the difference of structure and arrangement in the serotinal layer as compared with a normal third stage uterus also with the placenta attached.[1]

[1] Drawings of the placenta in adherent and normal third stage cases are given in the Proceedings of the Royal Society, Edinburgh, for 1888, and the Laboratory Reports of the Royal College of Physicians, Edinburgh, vol. i.

In the normal specimen we can recognise the following parts between villi and uterine wall:—

1. Where the serotina and villi meet we have a band of dense tissue, which stains more deeply, and is apparently formed by a blending of villi and serotinal tissue. Owing to its density its exact structure is difficult to make out accurately, but it is probably connective tissue, and processes from it pass up between the villi forming the partitions between the lobes. Occasionally one sees in it some of the cells of the large-celled layer.

2. *The large-celled layer*, sharply differentiated from the former, and made up of large endothelial-like cells, with nucleus and nucleolus. Scattered through this layer are many nuclei which stain deeply with logwood.

3. *The spongy layer.*—This is a broad, well-defined layer, with large spaces lined by perfect columnar epithelium.

4. A much less meshy layer lying on the uterine muscle.

The contour of the muscle is not flat but toothed.

In the sections of the adherent placenta the same structures can be made out, but *the mesh-work or spongy layer is much less marked, the spaces are markedly smaller, and in none of them can epithelium be detected.* There is no evidence, however, of chronic inflammatory affection—a point on which I had the valuable advice of Dr Woodhead. The cause of the non-separation here depended apparently on the defective development or pathological condition of the mesh-work or spongy layer, where the normal plane of separation for the placenta lies. How this has happened I am unable to explain, but the way in which it prevents separation is too evident to require special remark.

Cases of adherent placenta vary much in their degree, and range from those where no hæmorrhage accompanies the third stage, and where the separation of the placenta is easily performed by the hand, up to those where there is profuse hæmorrhage, sometimes proving rapidly fatal, as well as those where separation is effected manually with the greatest difficulty even by the most skilled, and where the patient runs grave risk of septicæmia. A clinical classification of adherent placenta, therefore, seems to me a requisite, and I submit the following as one based on the gravity of the case, and thus giving an idea of the prognosis.

1. *Cases of total adhesion, unaccompanied by hæmorrhage, where the separation of the placenta manually is easy, and is accomplished in the normal plane of separation.*

2. *Cases of partial adhesion high up in the uterus where the placenta is separated in its lower part, often accompanied by serious hæmorrhage. The upper adhesion is extensive.*

3. *Cases of adhesion low down, the placenta being separated above; not usually accompanied with hæmorrhage.*

4. *Cases of very perfect adhesion, usually accompanied with little hæmorrhage, but where separation is effected manually with great*

difficulty. The placenta is usually separated where the villi and serotina meet, and thus the uterus is left with the usual deciduous layer of the serotina still adherent, and often with portions of the fœtal placenta attached.

This classification is of course a sharp one, and combinations of the varieties often occur. The first class is the typical and easy one. The patient has probably had a previous endometritis, has a slow second stage, and then a third stage where the placenta is not separated and expelled in the usual time. I have noticed this slow second stage occasionally, and usually set it down to ineffective uterine pains owing to the adhesion preventing proper uterine retraction. During the third stage the uterus may contract irregularly, developing nodules, as it were, in its contour. As the placenta is not expelled within three quarters of an hour, and is still in the uterus and unseparated, the obstetrician makes up his mind to separate manually, a procedure easily accomplished. I need not give the details of this, but remark that the patient must be chloroformed, the vagina douched with corrosive sublimate (1 in 3000). The dorsal posture is the best, and both hands are employed, the outer one to steady and depress the uterus as required. The separation of the placenta is best effected from below up, the entire separation being finished before expulsion is brought about. Sometimes confusion to the inexperienced operator is caused by his passing his hand within the membranes instead of keeping outside them. That an antiseptic uterine douche be used after full expulsion, goes without saying.

The second class of case gives by far the most serious complication at the time. Blood pours from the relaxed uterine wall where the lower part of the placenta is separated, while the attachment above hinders uterine retraction. The attendant, despite all care to secure retraction by legitimate grasping and friction of the uterus, by hypodermics of ergotine, and the use of the hot douche, fails, and unless the placenta is promptly separated manually, so as to remove the cause of inefficient uterine action, the case may speedily become serious. Cases of ordinary flooding so readily, as a rule, yield to the usual means given above, that manual removal of the placenta is quite unnecessary interference. I think, however, that we err in waiting in this class of adherent placenta before resorting to separation by the use of the hand. No doubt the mistake can be rendered harmless by antiseptics, and further, the advice given here may be abused by the inexperienced, but experience will correct the error of undue meddling. I wish, therefore, to urge caution in this instance, viz., the attendant must always, in a flooding that looks threatening, remember the possibility of this dangerous upper adhesion of the placenta with the lower part separated. The greater the adhesion above the greater the risk.

The fourth class is not accompanied by flooding, but the union of uterus and placenta is so dense that separation is a matter of

immense difficulty. The placenta in such cases is separated where the villi and serotina blend, and the separated placenta is practically the fœtal portion with amnion and chorion. This is the case where septicæmia is to be feared. The uterus is left lined by a layer of dead tissue, affording a nidus for infection, and exposing the patient to the gravest septic risks. Such require most stringent antisepsis during the puerperium, and the immediate use of the intrauterine douche if any threatening of mischief arise.

Separation of the placenta when adherent may occur, therefore, in the following planes: (*a*) Where villi and serotina blend; (*b*) in normal trabecular layer; (*c*) even at a superficial distance below muscle, usually only partial.

In conclusion, I would urge a more systematic microscopical examination in all cases of adherent placenta, especially where any superficial muscle is removed.

Prof. Simpson had listened with great interest to the admirable paper, marked by the careful observation and ingenious and original reasoning that usually characterized Dr Hart's contribution. He would suggest that the designation which Dr Hart had applied to the loose structure at the plane of separation might be modified, as the term "trabecular" had already been years ago applied by Winkler and others to the expanded layer of the placenta intermediate between the parietal or uterine and subchorionic layers. The decidua vera was usually divided into a compact and spongy layer; and as the layer referred to in the paper corresponded to the deeper layer of the decidua, it might be called the spongy or separation layer. The divisions of adherent placenta which Dr Hart had suggested were probably correct in the main, and he (Prof. Simpson) recognised their clinical importance. Especially interesting and important were the observations made in one of the cases as to the diminution of the glandular spaces and the thickening of the interglandular connective tissue, which prevented the normal detachment of the placenta. It would be of great moment to make further observations as to these cases, as Dr Hart has said; but happily the opportunity of making such observations on the placenta *in situ* were rare, and when the placenta had been removed we have not all the material for examination, unless a layer of uterine muscular fibre has been stripped off with it. The important distinction between the cases of partial separation, where in one group the detachment had occurred lower down and in another higher, was, he (Prof. Simpson) believed, founded on true clinical observation. The cases, however, where the placenta was split through further from the muscular wall, between the uterine and trabecular or sinuous layers, must be very rare. At least he (Prof. Simpson) could not charge his memory with ever having seen a case where the large-celled or uterine layer was left adherent to the muscular wall, and when it did occur it would only be likely in very limited areas. He would

like to supplement the conditions of placental adhesion tabulated by Dr Hart, by the addition of the cases where the configuration of the placenta was at fault. The condition he (Prof. Simpson) had specially in view was the morbidly expanded area of placental development. The placenta, when of ordinary dimensions, has a relatively thick border, and forms a mass which can be grasped by the uterus for its expulsion; but where the placenta was of unusual extent it was flat, and thinned out towards the margins, and was in such cases very apt to remain adherent, and very difficult of separation at the hand of the practitioner.

Dr Halliday Croom thought Dr Hart had made an excellent grouping of the varieties of accidental hæmorrhage, and he believed that they were in the main correct. His own experience had led him to regard the lower separation as the more serious. As to the practical point, he had not found any special difficulty in removing an adherent placenta at term. With due antisepsis and under chloroform it was neither risky nor difficult. The trouble he had always found was in dealing with the condition in early pregnancy, where from the firmness or thickness of the abdominal walls it was impossible properly to depress the fundus and so make a clearance of the retained portion.

The President stated that Dr Hart's paper brought before them in a very able manner an important practical subject, because they all knew very well the anxiety which was caused by these cases, and the dangers which frequently attended them. He would point out, by way of criticism, that possibly some of the difference in the microscopical appearances between line of attachment of the adherent placenta which he showed them to-day, and the normal appearances of the same area, might be due to the fact that the case he showed them had been in spirit for a long time—months certainly, possibly years. The new point to him in Dr Hart's paper was the fact that adherent placentæ might be separated in various planes of the maternal portion of the placenta. This explained a case he had seen where he had to remove the placentæ of twins at the seventh month, where the placenta after removal appeared to have been separated at the line of junction of the maternal and fœtal part. There was no smooth cellular layer whatever upon its surface. He agreed there was much danger in partial adherence of the placenta, and he had seen a case where a small piece of placenta, situated in its very centre, had been adherent and had been left behind in the uterus. Severe hæmorrhage went on until this piece, about the size of a walnut, was removed.

Dr Milne Murray agreed with the Fellows who had already spoken in regard to the value of the paper Dr Hart had read. He wished to remark on one point of practical interest in the management of these cases. Dr Hart recommended the separation of these placentæ by detaching the structure from below upwards. Dr Murray thought that a certain advantage was to be gained by

reversing this process and commencing the separation from above downwards. It was easier to remove the whole structure at once by this method, and, further, we were less likely to miss any detached lobes (placentæ succenturatæ) by carrying the hand to the fundus at once, and thus exploring the whole uterus.

Dr Berry Hart thanked the Fellows for their kind reception of his paper. Dr Simpson's criticism of the term trabecular layer was quite a valid one; he used it as equivalent to the spongy layer. Dr Milne Murray urged that the placenta should be separated from above down; he had always found it easier to do so from below up.

VI. ON THE RELATIVE WEIGHTS OF THE PLACENTA AND CHILD.

By G. Owen C. Mackness, B.A. (Oxon.), M.B., C.M., late Resident Physician at the Royal Maternity Hospital, and at the Royal Infirmary, Edinburgh.

The idea that the weight of the placenta at full term is proportional to that of the child seems to be widely accepted. Many of our text-books agree in this view, while others make no mention at all of their relative weights.

For instance, Playfair says,[1]—"The size (of the placenta) varies greatly in different cases, and it is usually largest when the child is big, but not necessarily so."

Parvin writes,[2]—"Usually the weight of the placenta is in direct proportion with that of the child."

Charpentier says,[3]—"The weight of the placenta is, however, in proportion to the bulk of the child."

While resident at the Edinburgh Maternity Hospital I was struck with the number of exceptions that appeared to occur to the generally accepted rule, and I consequently started a series of investigations, the results of which are embodied in this paper.

A series of 200 cases were taken haphazard from the records kept at our Maternity Hospital; as far as possible only children born at full term were taken, while dead-born children and twins were excluded from the list. In the Hospital every placenta and child is weighed immediately after delivery, and the weights along with some other facts are recorded in a register kept for the purpose. The weights of these 200 children were added together and divided by 200, giving thus the average weight; the corresponding placentæ were treated in the same way. Thus there was obtained the average weight of the children with the corresponding average weight of the placentæ, viz., average weight of child 7 lbs. 5·97 oz., with an average weight of placenta 1 lb. 6·8 oz.

Table I. was then constructed as follows:—These 200 children were arranged in a series commencing with the heaviest child and

[1] *Science and Practice of Midwifery*, vol. i. p. 104.
[2] *Science and Art of Obstetrics*, p. 125.
[3] *Traité Pratique des Accouchements*, vol. i. p. 185.

going gradually down to the lightest one. Opposite each weight of child was placed the weight of the placenta found to be born with it. In some cases a number of children were born of the same weight but with placentæ of different weights; the *average weight* of these placentæ was then taken, *e.g.*, four children were born, each weighing 6 lbs. 4 oz., while the placentæ weighed respectively 1 lb. 2 oz. and three of 1 lb. 4 oz.—that is to say, an *average weight* of placenta of 1 lb. 3·5 oz. Thus the average weight of placenta that was born with each weight of child was obtained. The last column was obtained thus: It was found above that in these 200 cases the average weight of the children was 7 lbs. 5·97 oz., and the average weight of the placentæ 1 lb. 6·8 oz.; then by a simple proportion sum, if a child of 7 lbs. 5·97 oz. has a placenta of 1 lb. 6·8 oz., what weight of placenta should any given weight of child have if the placenta and the child are proportional in weight. The results so obtained were placed in the fourth column opposite the weights in the third column, which were those found to occur in actual practice. As a still further test, the process was reversed by placing the weights of the placentæ in a descending series, and placing opposite each given weight of placenta the weights of the children born with it. The fourth column in this case was formed in a similar way, substituting the weights of the children for those of the placentæ.

If, then, the law that the weight of the placenta is proportional to the weight of the child be true, the third and fourth columns should coincide. But on looking over the table this will be found in most instances not to be the case, while in very many instances the differences are very striking; this is especially evident in the second part of the table, where the children's weights corresponding to given weights of placentæ are placed. Another fact which at once strikes us on looking over this table is that with any given weight of placenta children of most varying weights are found, *e.g.*, with a placenta weighing 1 lb. 5 oz., fourteen children were born with weights varying from 6 lbs. to 8 lbs. 15 oz.

These 200 cases, of course, extend over a long period of time, and the weights were taken by several different people, who might not have been quite accurate in their observations, consequently I took another series of 130 cases which were all delivered during the year 1887, and in which the weights were all taken by the same person. The results are embodied in Table II., which is constructed on exactly the same principle as the former one. The results in this case are similar to those obtained in Table I.

Another objection that might be raised is that the weight of the placenta varies with the amount of blood which it contains, this of course depending on the time at which the cord is tied. Since these children were necessarily delivered by a number of different resident physicians, it is impossible to say that the cord was always tied at the same time after delivery in each case. I consequently took another series of 62 cases which were delivered

during the time that I was myself resident, and when we invariably tied the cord *immediately* after the birth of the child. These observations are to be found in Table III., which shows exactly the same results as the other two.

It will, I know, be argued that in compiling these tables the very small and very large placentæ and children should have been excluded from them. I do not think, however, that this is the case, for what I wish to show is that although the child be large we need not on that account expect to find a large placenta, and *vice versâ*. By excluding those cases which do not suit our purpose, it is of course easy to make statistics prove anything; but here the cases have been taken just as they came in the records, starting with an entirely unbiassed opinion, and quite willing to be convinced either way by the facts as they were found to exist.

Since these investigations were commenced there have been published some results from an infinitely larger number of cases occurring in the Dresden Lying-in Hospital. These state—"An endeavour was made to show the relationship of the size and weight of the placenta to the child, but the data would not admit of more than the assertion that the uterus of elderly women, from frequent menstruation, had large folds and elevations of the mucous membrane which favoured the formation of a large placenta. The uteri of multiparæ were also favourable to the formation of a large placenta, in consequence of the preceding involutions, which offered less resistance to the formation of a large placenta."[1] Of the truth or otherwise of these assertions I am quite unable to speak: on attempting to bring the relation of age and parity into the above calculations, the results were found to be far too complex to be satisfactorily worked out.

TABLE I.

Average Weight of Child in 200 Cases = 7 lbs. 5·97 oz.
" " Placenta " = 1 lb. 6·8 oz.

Weight of Child.	Weight of Placenta.	Average Weight of Placenta.	Proportional Weight that the Placenta should be.	Weight of Child.	Weight of Placenta.	Average Weight of Placenta.	Proportional Weight that the Placenta should be.
lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
9 8	1 12	1 13·$\frac{1}{2}$	1 13·488	8 10	1 10	1 7·75	1 10·772
	1 12				1 7		
	2 0				1 7		
9 6	2 8	2 8	1 13·1		1 7		
9 4	1 14	1 13·5	1 12·712	8 9	1 12	1 12	1 10·578
	1 13			8 8	1 14	1 9·7	1 10·384
9 2	2 0	2 0	1 12·324		1 12		
9 1	1 8	1 8	1 12·13		1 12		
9 0	2 1	2 1	1 11·936		1 12		
8 15	1 5	1 5	1 11·742		1 12		
8 14	1 4	1 4	1 11·548		1 11		
8 13	1 12	1 12	1 11·354		1 10		
8 12	1 13	1 8·3	1 11·16		1 10		
	1 12				1 10		
	1 12				1 9		
	1 9				1 9		
	1 8				1 6		
	1 4				1 5		
	1 0				1 4		

[1] *Medical Press*, Oct. 5th, 1887, p. 320.

TABLE I.—*continued.*

Weight of Child.		Weight of Placenta.		Average Weight of Placenta.		Proportional Weight that the Placenta should be.		Weight of Child.		Weight of Placenta.		Average Weight of Placenta.		Proportional Weight that the Placenta should be.	
lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
8	7	1	15	1	11	1	10·19	7	0	1	12	1	6·7	1	5·728
		1	7							1	10				
8	6	1	12	1	5·4	1	9·996			1	10				
		1	10							1	8				
		1	8							1	8				
		1	4							1	8				
		1	3							1	7				
8	5	1	4	1	4	1	9·802			1	6				
8	4	1	12	1	6·57	1	9·608			1	5				
		1	10							1	5				
		1	9							1	4				
		1	5							1	4				
		1	4							1	0				
		1	4					6	15	2	4	1	10·6̇	1	5·534
		1	2							1	8				
8	2	1	0	1	0	1	9·22			1	4				
8	1	1	8	1	8	1	9·026	6	14	1	7	1	4·4	1	5·34
		1	8							1	5				
8	0	1	10	1	4·375	1	8·832			1	4				
		1	6							1	3				
		1	4							1	3				
		1	4					6	13	1	10	1	6·6	1	5·146
		1	4							1	8				
		1	4							1	8				
		1	3							1	5				
		1	0							1	2				
7	14	2	0	1	7·75	1	8·44	6	12	1	12	1	4·4̇	1	4·952
		1	6							1	11				
		1	6							1	5				
		1	3							1	4				
7	13	1	9	1	9	1	8·25			1	4				
7	12	1	9	1	5·5	1	8·056			1	2				
		1	5							1	2				
		1	4							1	0				
		1	4							1	0				
7	10	1	10	1	7·6	1	7·668	6	11	1	11	1	5·5	1	4·758
		1	8							1	0				
		1	8					6	10	1	8	1	6	1	4·564
		1	6							1	7				
		1	6							1	5				
7	9	1	4	1	4	1	7·474			1	4				
7	8	1	14	1	6·9	1	7·28	6	9	1	8	1	3·75	1	4·37
		1	10							1	4				
		1	8							1	2				
		1	7							1	1				
		1	7					6	8	1	9	1	4·6̇	1	4·176
		1	7							1	4				
		1	5							1	1				
		1	4					6	6	1	9	1	4·8	1	3·788
		1	4							1	5				
		1	3							1	4				
7	7	2	0	1	9	1	7·086			1	4				
		1	7							1	2				
		1	4					6	5	1	9	1	3·3̇	1	3·594
7	6	1	8	1	5·6̇	1	6·892			1	1				
		1	5							1	0				
		1	4					6	4	1	4	1	3·5	1	3·4
7	5	1	9	1	5·5	1	6·698			1	4				
		1	2							1	4				
7	4	1	14	1	6·625	1	6·504			1	2				
		1	9					6	3	1	12	1	6	1	3·206
		1	8							1	0				
		1	7					6	2	0	15	0	14·5	1	3·012
		1	6							0	14				
		1	4					6	1	1	10	1	10	1	2·818
		1	3					6	0	1	5	0	15·5	1	2·624
		1	2							0	10				
7	3	1	7	1	7	1	6·310	5	14	1	4	1	4	1	2·236
7	2	1	15	1	6	1	6·116	5	13	1	2	1	2	1	2·042
		1	10							1	2				
		1	4					5	12	1	4	1	4	1	1·848
		1	4					5	10	1	8	1	8	1	1·46
		1	3					5	8	1	7	1	2·75	1	1·072
		1	0							1	4				
7	1	1	3	1	1·6	1	5·922			1	4				
		1	2							0	12				
		1	0					5	7	1	1	1	1	1	0·878

TABLE I.—*continued.*

Weight of Child.		Weight of Placenta.		Average Weight of Placenta.		Proportional Weight that the Placenta should be.		Weight of Placenta.		Weight of Child.		Average Weight of Child.		Proportional Weight that the Child should be.	
lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
5	6	1	13	1	7·5	1	0·684	1	9	6	6				
		1	2							6	5				
5	4	1	0	0	15	1	0·296	1	8	9	1	7	5·95	7	12·176
		0	14							8	12				
5	0	1	3	1	2	0	15·52			8	6				
		1	1							8	1				
4	12	1	4	1	4	0	14·744			8	1				
4	β	1	6	1	6	0	13·58			7	10				
										7	10				
										7	8				
										7	6				
										7	4				
										7	0				
										7	0				
										7	0				
Weight of Placenta.		Weight of Child.		Average Weight of Child.		Proportional Weight that the Child should be.				6	15				
lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.			6	13				
2	8	9	6	9	6	12	14·96			6	13				
2	4	6	15	6	15	11	10·264			6	10				
2	1	9	0	9	0	10	10·762			6	9				
2	0	9	8	8	7·75	10	5·568			5	10				
		9	2												
		7	14					1	7	8	10	7	7·643	7	7·002
		7	7							8	10				
1	15	8	7	7	12·5	10	0·394			8	10				
		7	2							8	7				
1	14	9	4	8	2	9	11·22			7	8				
		8	8							7	8				
		7	8							7	8				
		7	4							7	7				
1	13	9	4	7	12·6̇	9	6·046			7	4				
		8	12							7	3				
		5	6							7	0				
1	12	9	8	8	4·7̇8̇	9	0·872			6	14				
		9	8							6	10				
		8	13							5	8				
		8	12					1	6	8	8	7	7·2	7	1·828
		8	12							8	6				
		8	9							8	0				
		8	8							7	14				
		8	8							7	14				
		8	8							7	10				
		8	8							7	10				
		8	6							7	4				
		8	4							7	0				
		7	0							4	6				
		6	12					1	5	8	15	7	4·286	6	12·654
		6	3							8	8				
1	11	8	8	7	5	8	11·698			8	4				
		6	12							7	12				
		6	11							7	8				
1	10	8	10	7	11·285	8	6·524			7	6				
		8	8							7	0				
		8	8							7	0				
		8	8							6	14				
		8	6							6	13				
		8	4							6	12				
		8	0							6	10				
		7	10							6	6				
		7	8							6	0				
		7	2					1	4	8	14	7	1·718	6	7·48
		7	0							8	12				
		7	0							8	8				
		6	13							8	5				
		6	1							8	4				
1	9	8	12	7	9·1̇8̇	8	1·35			8	4				
		8	8							8	0				
		8	8							8	0				
		8	4							8	0				
		7	13							8	0				
		7	12							7	12				
		7	5							7	12				
		7	4							7	9				
		6	8							7	8				

TABLE I.—*continued.*

Weight of Placenta.	Weight of Child.	Average Weight of Child.	Proportional Weight that the Child should be.	Weight of Placenta.	Weight of Child.	Average Weight of Child.	Proportional Weight that the Child should be.
lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
1 4	7 8			1 2	8 4	6 10·3	5 13·152
	7 7				7 5		
	7 6				7 4		
	7 4				7 1		
	7 2				6 13		
	7 2				6 12		
	7 0				6 12		
	7 0				6 9		
	6 15				6 6		
	6 14				6 4		
	6 12				5 13		
	6 12				5 13		
	6 10				5 6		
	6 9			1 1	6 9	5 15·4	5 7·958
	6 8				6 8		
	6 6				6 5		
	6 6				5 7		
	6 4				5 0		
	6 4			1 0	8 12	7 0	5 2·748
	6 4				8 2		
	5 14				8 0		
	5 12				7 2		
	5 8				7 1		
	5 8				7 0		
	4 12				6 12		
1 3	8 6	7 3·1	6 2·806		6 12		
	8 0				6 11		
	7 14				6 5		
	7 8				6 3		
	7 4				5 4		
	7 2			0 15	6 2	6 2	4 13·61
	7 1			0 14	6 2	5 11	4 8·436
	6 14				5 4		
	6 14			0 12	5 8	5 8	3 14·088
	5 0			0 10	6 0	6 0	3 3·74

TABLE II.

Average Weight of Child in 130 cases born during part of 1887 = 7 lbs. 6·03 oz.

" " Placenta " " = 1 lb. 6·52 oz.

Weight of Child.	Weight of Placenta.	Average Weight of Placenta.	Proportional Weight that the Placenta should be.	Weight of Child.	Weight of Placenta.	Average Weight of Placenta.	Proportional Weight that the Placenta should be.
lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
11 0	1 4	1 4	2 1·44	8 5	1 8		
10 0	1 10	1 10	1 14·4		1 5		
9 13	2 0	2 0	1 13·83	8 4	1 11	1 8	1 9·06
9 10	1 14	1 14	1 13·26		1 7		
9 4	2 0	1 13	1 12·12		1 6		
	1 10			8 3	2 3	1 12	1 8·89
9 2	1 8	1 8	1 11·74		1 5		
9 0	1 12	1 12	1 11·36	8 1	1 8	1 8	1 8·51
	1 12			8 0	1 9	1 5·6	1 8·32
8 15	1 8	1 8	1 11·17		1 6		
8 13	1 11	1 7·6	1 10·79		1 3		
	1 8			7 15	1 3	1 1·5	1 8·13
	1 4				1 0		
8 12	1 8	1 8	1 10·6	7 14	1 9	1 9	1 7·94
8 11	1 14	1 12	1 10·41	7 13	1 4	1 4	1 7·75
	1 10			7 12	1 8	1 6·4	1 7·56
8 10	1 5	1 4·5	1 10·22		1 8		
	1 4				1 6		
8 8	1 11	1 8·5	1 9·84		1 6		
	1 8				1 4		
	1 8			7 11	2 0	1 11	1 7·37
	1 7				1 9		
8 6	2 0	2 0	1 9·46		1 8		
8 5	1 12	1 8·5	1 9·27	7 9	1 8	1 6	1 6·99
	1 9				1 8		

TABLE II.—*continued.*

Weight of Child.		Weight of Placenta.		Average Weight of Placenta.		Proportional Weight that the Placenta should be.		Weight of Placenta.		Weight of Child.		Average Weight of Child.		Proportional Weight that the Child should be.	
lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
7	9	1	4					2	3	8	3	7	13·5	11	7·4
		1	4							7	8				
7	8	2	3	1	7·36	1	6·81	2	0	9	13	8	7·4	10	7·68
		1	14							9	4				
		1	8							8	6				
		1	8							7	11				
		1	7							7	3				
		1	6					1	14	9	10	8	9·6	9	13·2
		1	6							8	11				
		1	4							7	8				
		1	4					1	12	9	0	8	2	9	1·72
		1	3							9	0				
		1	2							8	5				
7	7	1	9	1	6·6	1	6·61			7	5				
		1	7							7	0				
		1	4					1	11	8	13	8	1·75	8	12·48
7	6	1	8	1	6·5	1	6·42			8	8				
		1	5							8	4				
7	5	1	12	1	8	1	6·3			6	14				
		1	4					1	10	10	0	7	15·5	8	8·24
7	4	1	8	1	6	1	6·04			9	4				
		1	8							8	11				
		1	6							7	0				
		1	4							6	8				
		1	4							6	6				
7	3	2	0	1	6·75	1	5·85	1	9	8	5	7	13·3	8	3
		1	8							8	0				
		1	2							7	14				
		1	1							7	11				
7	2	1	6	1	5	1	5·64			7	7				
		1	5					1	8	9	2	7	7·5	7	13·76
		1	4							8	15				
7	1	1	8	1	5	1	5·45			8	13				
		1	2							8	12				
7	0	1	12	1	7·3	1	5·26			8	8				
		1	10							8	8				
		1	8							8	5				
		1	8							8	1				
		1	8							7	12				
		1	7							7	12				
		1	5							7	11				
		1	4							7	9				
		1	4							7	9				
6	14	1	11	1	5·75	1	4·88			7	8				
		1	8							7	8				
		1	4							7	6				
		1	0							7	4				
6	13	1	0	1	0	1	4·69			7	4				
6	12	1	7	1	3	1	4·5			7	3				
		1	5							7	1				
		1	4							7	0				
		0	12							7	0				
6	8	1	10	1	8·5	1	3·74			7	0				
		1	7							6	14				
6	7	1	4	1	4	1	3·55			6	6				
6	6	1	10	1	7·6	1	3·36			6	2				
		1	8							5	14				
		1	5							4	8				
6	5	1	4	1	4	1	3·17	1	7	8	8	7	6·7	7	8·52
6	4	1	4	1	4	1	2·98			8	4				
6	3	1	0	1	0	1	2·79			7	8				
6	2	1	8	1	6	1	2·6			7	7				
		1	4							7	0				
6	0	1	6	1	1·5	1	2·22			6	12				
		1	2							6	8				
		1	0					1	6	8	4	7	3·2	7	3·28
		1	0							7	12				
5	14	1	8	1	6	1	1·84			7	12				
		1	4							7	8				
5	13	1	2	1	2	1	1·65			7	8				
5	11	1	6	1	6	1	1·27			7	4				
5	10	1	2	1	2	1	1·08			7	2				
5	8	1	4	1	4	1	0·7			6	0				
5	5	1	1	1	1	1	0·13			5	11				
5	4	1	0	0	14	0	15·94	1	5	8	10	7	8·4	6	14·04
		0	12							8	5				
5	0	1	0	0	15	0	15·18			8	3				
		0	14							8	0				
4	14	1	4	1	4	0	14·72			7	6				
4	8	1	3	1	3	0	13·58			7	2				

TABLE II.—*continued.*

Weight of Placenta.	Weight of Child.	Average Weight of Child.	Proportional Weight that the Child should be.	Weight of Placenta.	Weight of Child.	Average Weight of Child.	Proportional Weight that the Child should be.
lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
1 5	7 0			1 4	5 14		
	6 12				5 8		
	6 6				4 14		
1 4	11 0	7 2·9	6 8·8	1 3	8 0	7 13	6 3·56
	8 13				7 15		
	8 10				7 8		
	7 13			1 2	7 8	6 8·5	5 14·32
	7 12				7 3		
	7 9				7 1		
	7 9				6 0		
	7 8				5 13		
	7 8				5 10		
	7 7			1 1	7 3	6 4	5 9·08
	7 5				5 5		
	7 4			1 0	7 15	6 4·12	5 3·64
	7 4				6 14		
	7 2				6 13		
	7 0				6 3		
	7 0				6 0		
	6 14				6 0		
	6 12				5 4		
	6 7				5 0		
	6 5			0 14	5 0	5 0	4 9·36
	6 4			0 12	6 12	6 0	5 14·88
	6 2				5 4		

TABLE III.

Average Weight of Child in 62 cases born during Quarter ending 31st October 1887 = 7 lbs. 3·45 oz.

Average Weight of Placenta in 62 cases born during Quarter ending 31st October 1887 = 1 lb. 7·19 oz.

Weight of Child.	Weight of Placenta.	Average Weight of Placenta.	Proportional Weight that the Placenta should be.	Weight of Child.	Weight of Placenta.	Average Weight of Placenta.	Proportional Weight that the Placenta should be.
lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
9 10	1 7	1 7	1 14·8	7 1	1 7	1 7	1 6·6
9 8	2 0	2 0	1 14·4	7 0	1 9	1 7·6̇	1 6·4
9 5	1 14	1 14	1 13·8		1 8		
9 4	1 15	1 15	1 13·6		1 6		
9 2	1 9	1 9	1 13·2	6 15	1 2	1 2	1 6·2
8 14	1 7	1 7	1 13·4	6 14	1 8	1 5	1 6
8 12	1 7	1 7	1 12		1 4		
8 10	1 12	1 11·3̇	1 11·6		1 3		
	1 11			6 13	1 8	1 8	1 5·8
	1 11			6 11	1 6	1 4	1 5·4
8 8	2 2	1 14·5	1 11·2		1 4		
	1 11				1 2		
8 4	1 9	1 7·5	1 10·4	6 10	1 4	1 4	1 5·2
	1 6			6 8	1 9	1 6·3̇	1 4·8
8 3	1 8	1 8	1 10·2		1 6		
8 2	1 4	1 4	1 10		1 4		
8 0	1 12	1 12	1 9·6	6 7	1 7	1 5·6̇	1 4·6
7 15	1 8	1 8	1 9·4		1 4		
7 14	1 6	1 6	1 9·2		1 3		
7 13	2 0	1 14	1 9	6 6	1 7	1 7	1 4·4
	1 12			6 3	1 5	1 2·5	1 3·8
7 12	1 4	1 4	1 8·8		1 0		
7 11	1 9	1 9	1 8·6	6 2	1 3	1 3	1 3·6
7 8	1 12	1 12	1 8	5 12	1 9	1 6·5	1 2·4
7 7	1 9	1 9	1 7·8		1 4		
7 6	1 4	1 4	1 7·6	5 11	1 4	1 4	1 2·2
7 5	2 2	1 10·5	1 7·4	5 6	1 8	1 8	1 1·2
	1 3			5 5	1 0	1 0	1 1
7 4	1 3	1 3	1 7·2	5 4	1 0	1 0	1 0·8
7 3	1 9	1 9	1 7	4 11	1 0	1 0	0 15
7 2	1 9	1 9	1 6·8	3 4	1 3	1 3	0 10·4

TABLE III.—*Continued.*

Weight of Placenta.	Weight of Child.	Average Weight of Child.	Proportional Weight that the Child should be.	Weight of Placenta.	Weight of Child.	Average Weight of Child.	Proportional Weight that the Child should be.
lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
2 2	8 8	7 14·5	10 9·25	1 7	7 1		
	7 5				6 7		
2 0	9 8	8 10·5	9 15·29		6 6		
	7 13			1 6	8 4	7 4·2	6 13·51
1 15	9 4	9 4	9 10·29		7 14		
1 14	9 5	9 5	9 5·34		7 0		
1 12	8 10	7 15·75	8 11·38		6 11		
	8 0				6 8		
	7 13			1 5	6 3	6 3	6 8·54
	7 8			1 4	8 2	6 12·5	6 3·56
1 11	8 10	8 9·3	8 6·4		7 12		
	8 10				7 6		
	8 8				6 14		
1 9	9 2	7 5·4	7 12·45		6 11		
	8 4				6 10		
	7 11				6 8		
	7 7				6 7		
	7 3				5 12		
	7 2				5 11		
	7 0			1 3	7 5	6 3·3	5 14·58
	6 8				7 4		
	5 12				6 14		
1 8	8 3	7 0·5	7 7·47		6 7		
	7 15				6 2		
	7 0				3 4		
	6 14			1 2	6 15	6 13	5 9·6
	6 13				6 11		
	5 6			1 0	6 3	5 5·75	4 15·65
1 7	9 10	7 13·6	7 2·49		5 5		
	8 14				5 4		
	8 12				4 11		

Professor Simpson thought the Society and profession were much indebted to Dr Mackness for the labour he had taken in compiling this paper. There were so many elements that entered into the production of weight of the secundines, that it was easy to understand that there might be all the want of correspondence that Dr Mackness had found between weight of child and weight of placenta. For what was needed was that there should be intercommunication between fœtal and maternal blood, more or less free, according to the greater or less size of the infant, and this could be provided for apart from mere mass of the placenta.

The *Secretary* read the following paper:—

VII. THE RELATIONSHIP BETWEEN NEURALGIA AND ABORTION: A CLINICO-SPECULATIVE NOTE.

By A. D. Leith Napier, M.D., M.R.C.P. Lond., F.R.S.E., London.

Reflex neural disturbances is confessedly a difficult subject to handle judiciously. The term "reflex causes," like our familiar and much-abused friends "dyspepsia" and "febricula," is in great measure simply a wide and unexplored scientific desert, in which

the barren sands of speculations, uncertain and indefinite, are immeasurably more plentiful than the grateful and refreshing wells of sparkling precision, or the comforting oases of confident opinion. How to clearly understand reflex neuroses, how to estimate their force and import, is still an unsettled problem of our modern medicine. If we as obstetricians accept, even in a restricted sense, the dictum of Marshall Hall, "The whole question of abortion and parturition, and, in a word, of Obstetrics as a science, is one of the true spinal system,"[1] surely it behoves us to devote renewed attention to so important a theme. In a former communication[2] to this Society I touched upon reflex paralysis in connexion with puerperal albuminuria; in the subsequent valuable discussion[3] doubts were suggested by one or more of the speakers with reference to the risks I encountered when I ventured on "the dangerous ground" of reflex paralysis. Other speakers, notably Surgeon-major Arnott, who spoke with reference to practice in India, referred to several cases of convulsions, which seemed solely due to mere irritation of the nervous system. The purport of the present paper is to deal only with that form of neurotic affection which is called neuralgia.

Many years ago it was shown by Tyler Smith that irritation of the excitor nerves and of the spinal centres formed the two classes: excentric and centric causes of abortion. He thought that irritation of the extremities of the excitor nerves, as, for example, irritation of the mammary nerves (what he referred to as the "synergic relations between the mammæ and the uterus"), and which he seemed to regard as wholly peripheral, was due to some peculiar and direct sympathy. He remarked "that gastric irritation had no effect in producing abortion," nor was "the most extensive lung disease accountable," although "the synergies between the lungs and uterus were remarkable." He admitted that irritation of the trifacial was an occasional cause, and that sometimes when no other explanation than the appearance of the wisdom teeth was the local determinant. Vesical irritation from calculi or chronic inflammation was also mentioned. Rectal nerve irritation is "a common cause of abortion," according to the same writer; as also is vaginal nerve and ovarian nerve irritation. I am not disposed to accept the entire truth of these observations; yet there are no grounds for disputing Smith's influence on the subject as being distinctly helpful to those who have read his unquestionably meritorious and original ideas. He further states, "Irritation of the uterine nerves is beyond doubt the most important of all the causes of abortion; and all these causes, whether vaginal, mammary, vesical, rectal, facial, or uterine, are purely excito-motor in their operation. The irritation is applied

[1] *Diseases and Derangements of the Nervous System.*
[2] *Transactions*, vol. ix. p. 122.
[3] *Ibid.*, p. 191 *et seq.*

to the excitor nerves, and reflected through the spinal marrow upon the motor nerves and the uterus."[1]

Modern physiology has determined certain definite groups of nerves with distinct functions, which, so far as they now concern us, may be mentioned:—(1.) The centrifugally conducting nerves, motor nerves for the smooth muscles, usually involuntary, with secretory, trophic, inhibitory, and vaso-dilator nerves; (2.) The centripetally conducting nerves of excito-motor or reflex function. We recognise the fact that the nerves entering the uterine mucous membrane are connected with ganglia. In normal gestation there is a state of neurotic impressibility which manifests itself at times by uncertainty of temper or sleeplessness; by perversions of taste or smell; by sickness, by amblyopia, hemeralopia, vertigo, syncope, hyperæsthesia, or attacks of neuralgia. It is, of course, debatable whether these symptoms are due to reflex causes in consequence of the changed conditions in the sexual organs, or to the leucocythæmia of pregnancy and the consequent results.

While there is generally heightened nervous susceptibility, there is uterine resistance to impressions, or, in other words, increased nervous inhibition to a markedly great degree. And this action, although imperfectly understood, is not one of abeyance of excito-motor action and interruption to the conveyance of reflex sensations. The theory has formerly been suggested that there is "an independence and seclusion of the nervi-motor apparatus of ovi-expulsion until the appearance of the exciting causes of labour." While we admit the existence of distinct centres for uterine action, it is difficult to follow a theory which postulates that the presence of an embryo of varying size and relation to the uterus can produce a local blocking of reflex impressions. During and immediately after parturition the spinal centres distinctly control the uterus, yet it is argued that "during pregnancy no reflex action sufficient to cause abortion will follow immediately upon the application of the ordinary stimuli of excito-motor action." Now all through pregnancy, very markedly during the latter months, there are very distinct uterine contractions due to reflex impressions; but it is contended that "it is necessary that the nervous arcs in relation with the uterus must be continuously irritated for a considerable time ere reflex action occurs." Admitting that time is after all only a relative term, we may broadly deny the necessity for a prolonged irritation. Emotions, as anger, fear, joy, etc., which have lasted for only a very short time, are clinically admitted causes of abortion.

It may best serve our purpose to leave for the present the theoretical, and regard certain practical and clinical facts. Let us recall the nervous supply of the uterus, and we will note that in continuance with and from the great splanchnic we have the aortic plexus, which divides into branches, giving rise to the inferior

[1] *On Parturition*, p. 127, etc.

hypogastric, from which we have uterine and vaginal branches; and the aortic plexus terminating in the hypogastric, which originates the uterine and ovarian plexuses. The hypogastric is also in close connexion with four lumbar ganglia; and also in descent from the aortic plexus we have directly the inferior mesenterics; so that it is easy to realize how many and important direct results may be due to disturbance of the reflex nerve supply.

Neuralgia of cranial and spinal nerves is very often associated with abortion. The trifacial, the occipital, the brachial, the intercostals, the sciatic, and the pneumogastric are not uncommonly affected.

One of my patients, who had aborted very frequently, before abortion had always a sharp neuralgic attack, principally affecting the lachrymal and frontal branches of the fifth, and running down the cervical plexus to about the middle of the neck. She had in addition considerable gastric pain, with a tendency to flatulent eructations. In this case the neuralgia of the head and neck invariably preceded uterine action, and at no other times was this lady a sufferer from neuralgia. Another patient, who was never previously neuralgic, was during the sixth month of her first pregnancy attacked with severe gastralgia with nausea, but had no vomiting. Fœtal movements became feeble, very acute neuralgia of one side of the face and neck supervened, and seven days from the onset of the painful symptoms she was prematurely delivered of a dead child. Another case had neuralgia confined to the intercostals and brachial of one side in two successive pregnancies; abortion took place at three months in the first, and was averted in the second. A fourth lady had acute neuralgia of the face and down one arm, with distinct uterine contractions resulting, at each period for the first six months of her first pregnancy. I might give many other cases, but will rather state my experience aphoristically.

(1.) Neuralgia and abortion are frequently associated.

(2.) In certain cases of "habitual abortion," neuralgia invariably manifests itself as the first symptom, attacking cranial or spinal nerves remote from the uterus.

(3.) If treatment relieves the pain there is a strong probability that uterine disturbance will not commence, or, if already there have been contractions, these will cease.

(4.) Neuralgia, while perhaps most common in the rheumatic, occurs in different types of patients: in the anæmic, dyspeptic, or mal-nourished; or in the overfed, indolent, and plethoric.

(5.) Fœtal death is sometimes the evident cause; sometimes evidently results from the reflex irritation associated with the neuralgic pain.

(6.) Acute neuralgias occurring in pregnancy may not in any way interrupt healthy gestation.

(7.) When severe facial, cervical, or other neuralgia yields to treatment, even although the embryo is dead, uterine contractions and emptying will not occur for days, perhaps weeks.

(8.) The trifacial, occipital, and cervical nerves are most commonly affected; but brachial, intercostal, lumbar, and sciatic neuralgias are also met with.

(9.) Acute gastric irritation is associated with neuralgia and abortion. Pregnancy sickness, although very severe, but seldom causes miscarriage; but gastrodynia, which is sometimes accompanied by salivation and a constant feeling of nausea and depression, not infrequently precedes acute neuralgia, which eventually causes uterine irritation, and ends in abortion.

The neuralgias of the sciatic may be rheumatic or due to pressure or other purely local causes, and the latter will specially apply to rectal and vesical neuralgia. Ovarian neuralgia is in my experience a very common condition in aborting women, and I believe accounts for many unexplained cases; yet we can hardly separate ovarian from uterine irritation as distinct conditions during gestation. Some cases, indeed, admit of easy discrimination. One patient who threatened to abort at the second, third, and fourth months, was on each occasion treated by bromides, and a blister applied over the left ovarian region, which was markedly tender, and she carried her child to term. She had previously miscarried twice with similar symptoms. It has, however, been said that "physical irritation of excitor surfaces short of pain or sensation may produce the entire phenomena of abortion." This is possibly true, but not very probable. As a supplementary observation, I would add that painful sensations remote from the uterus not infrequently originate abortion.

I have said nothing of neuralgia from dental caries; for although dental caries is so common in pregnancy, and although neuralgia very frequently results, I have never known abortion follow this form of neuralgia. Toothache in pregnancy should be treated on general principles. I have never seen ill effects follow tooth extraction in pregnancy. I have always advised the exhibition of nitrous oxide or chloroform for such operations; or else, failing the suitability of anæsthesia, have ordered applications of local sedatives, as camphor and chloral, or chloroform, to be used as temporary measures until after parturition.

The fact is, that neuralgias due to peripheral irritation, such as a decayed tooth, or bladder concretion, or rectal hæmorrhoids or growths, seem to be much less important than neuralgias associated with general constitutional states which have no available local explanation. The shocks of grave operations, *e.g.*, ovariotomy and herniotomy, etc., have been undergone during pregnancy without the least indication of uterine disturbance.

In neuralgia which precedes abortion we have a certain periodicity, a recurrence marked by such regularity in some cases

that there seems to be a suggested special or peculiar cause. I do not recollect any connexion with distinct or even slight ague; but although there are no clinical symptoms of malaria further than the periodicity, we have to remember that we have not only a condition of hydræmia, but, according to Virchow, a "physiological leucocythæmia of the blood," and this in connexion with splenic enlargement, more or less permanent, in normal gestation. We have flushings, sweats, and chills; we have temporary albuminuria, temporary glycosuria—all as, by no means rare, manifestations of puerpery.

But there must be, there is, a distinctly different pathological consideration forced upon us,—Why do these conditions cause no interference with some cases and prove very prejudicial in others? Are the theories of reflex action or of blood deterioration the more important? Are there no other possible explanations? Is it permissible to suggest that, as in certain organic neuroses causing loss of speech, sight, taste, smell, and locomotion, and as in some of these, in which only certain limited areas of cerebral or spinal surface are affected, we have only very partial irritations or paralysis, there may be, in like manner, as a consequence of the general perversion of pregnancy, actual limited organic paralysis, as well as increased excito-motor sensibility? Push this argument a step further. As we have increased body weight (quite beyond the uterine burden), enlargement of heart, bloodvessels, liver, glands, kidneys, etc., why deny the possible production of increased multiplication and enlargement of neuroglia and nervous tissue generally? As we have traced the uterine nerve supply to the splanchnic, so might we proceed upwards through the whole chain of sympathetic ganglia till we reached the upper cervical ganglia with its internal brain and spinal connexions. And if, in consequence of an undue accumulation of neuroglia cells, possibly from an exaggeration of the normal blood of pregnancy, or again from the fibroid changes of rheumatism, or from the sometimes exceedingly obscure lesions of neural syphilis, we had an interruption to the perfect conveyance of nervous impressions, and probably a condition of "blocked nerve impulses," it would not be difficult to realize that should any untoward circumstance arise, irregular reflex disturbances would be apt to occur.

The deduction therefore is, that there are two sets of nerve affections in pregnancy—(1), those of simple localized peripheral origin, as neuralgia from dental caries, from vesical, rectal, or pelvic pressure, which seldom go on to cause uterine neuralgia of such degree as will end in contractions sufficient to cause premature expulsion of the embryo; and (2), neuroses, which owe their origin to general conditions of constitutional disturbance, and which may manifest themselves by appearing as acute neuralgia of cranial or spinal nerves.

In the latter class the inhibitory action will sooner or later be

gravely affected, and the normal excito-motor conditions will speedily involve the organ upon which physiological action has exercised its paramount influence,—that is to say, a patient, suffering, for example, from chronic rheumatism, will be apt to abort not only from chronic rheumatic endometritis, but from the central neural disturbance due to the blood deterioration. Neuralgia occurring in such a case may be facial or intercostal, but speedily becomes uterine, not from peripheral, but from central causes of irritation. A few hours after the commencement of an acute rheumatic neuralgia in the head and neck, sharp ovarian and uterine irritation is experienced; contractions, at first spasmodic, and then regular, sharp, and in muscular waves, accompanied by hæmorrhagic effusions, may very shortly terminate the pregnancy.

I have found that the successful control of neuralgia in pregnancy demands attention to one or two points. If the patient is anæmic, quinine given alone in ten-grain doses twice daily, or, still better, with a grain of opium with each dose, is best as an immediate sedative, and free doses of arsenical solution are most useful as inter-attack treatment. But when the patient is plethoric, especially if there is a gouty or rheumatic tendency, chloride of ammonium, ten to fifteen grains, every two, three, or four hours, with bromides of ammonium or sodium, opium, and aconite, or with veratrum, will answer best. Viburnum prunifolium is of the greatest value in some cases, and certainly ought to be given as soon as the uterine pains are felt. The Liq. Caulophyllum et Pulsatillæ Co. promises to prove valuable as a uterine and ovarian sedative, and might be given either alone, or with viburnum in lessened doses, as soon as acute pain has subsided. Other patients will do well with antipyrin, gr. xv., every two or three hours, or iodides and alkalies; and for some I conceive a course of baths at Kissingen, Kreuznach, Ems, or Wiesbaden, will do more good than any drug. But we must act promptly and dose liberally during the acute attack of neuralgia.

Dr Sinclair believed that Dr Napier's paper embraced a very wide area. Neuralgias are ascribed by him to (1), Reflex irritation; and (2), Changes in blood. The anæmic and hydræmic condition of blood during pregnancy appears to be quite a sufficient cause for the neuralgic pains independent of any reflex causes. If the latter had much to do with their production, convulsive movements would be more probably the result or accompaniment, and these are rare during the early months of pregnancy. The association between neuralgia and abortion was of much interest, although a careful perusal of the paper would be necessary before many remarks or criticisms could be applied.

The President said that Dr Napier's paper was a thoughtful, but, at the same time, a very theoretical one. He quite agreed with Dr Napier that the ordinary neuralgias of the head and neck may

occur very commonly without any interruption of pregnancy. But he thought Dr Napier laid far too much stress upon the neuralgic pains, which, after all, were mere accidental accompaniments, as it were, and not sufficient upon the constitutional states which underlay them. He was not prepared to follow Dr Napier in the large and frequently repeated doses of quinine which he gave, as there was some evidence to show that quinine occasionally acted as an ecbolic.

MEETING III.—JANUARY 9, 1889.

Dr FOULIS, *Vice-President, in the Chair.*

I. *Dr Foulis* showed—(*a.*) his new ASPIRATOR SYRINGE, and described how it could be used as a syphon and as a stomach-pump. Its great advantage was that at all times the operator had perfect control over the suction process. It was possible to hasten or slow the flow of fluid into the exhausted bottle at the will of the operator, and all danger of injuring delicate tissues during aspiration was thus avoided. (*b.*) His improved GLOSSOTILT, and demonstrated how it could be used, both in the adult and in the child, as a means of raising the hyoid bone and the epiglottis and aryteno-epiglottic folds at one and the same time. It was quite impossible to carry out artificial respiration properly when the mouth was closed, as in forced respiratory efforts through the nares obstructive valving of the nasal flaps was sure to occur. Dr Foulis bent back the neck and the head on the atlas vertebra as the first step to the introduction of the glossotilt, which could be introduced with the greatest ease both in the adult and child.

II. *Dr Halliday Croom* showed TWO CYSTS—BLOOD CYSTS OF OVARY—from a lady aged 40. The entire ovarian tissue had been destroyed, and nothing remained of the ovaries on either side but old clots contained within a thin cyst wall. The condition, like that of a former specimen he had shown, was associated with frequent miscarriage in early married life, and, later, with irregular hæmorrhage and much pelvic pain.

III. NOTE ON SAEXINGER'S AND WINTER'S SECTIONS.

By A. H. F. BARBOUR, M.D., F.R.C.P.E., Lecturer on Midwifery and Diseases of Women in the School of Medicine, Edinburgh, etc.

PROFESSOR SAEXINGER of Tübingen published in June last a frozen section of a case that died during the first stage of labour. The subject, 18 years of age, was admitted to the Maternity in

December 1887. She was suffering from phlegmonous inflammation of the right breast. The uterus was four fingerbreadths above the umbilicus, the child being alive and in the first position. The external conjugate measured 7½ in. (18·5 cm.) She died from sepsis eleven days after admission, about a month before her confinement was due. Labour pains were present a few hours before death, and it was then noted that the finger passed through both external and internal os, and that the head was low and in the first position.

In the beautiful drawings of this section in Dr Saexinger's *Atlas* the following points are of special interest.[1]

The length of the lower uterine segment and the position of the bladder are noteworthy. The reflection of the utero-vesical peritoneum is ½ in. (1·2 cm.) above the pubes; and, extending from os externum to this point,[2] we have 3¾ in. (9·4 cm.)[3] in which the wall is only about half the thickness of what it is throughout the rest of the anterior wall and fundus (·2 cm. instead of ·4 cm.)

The bladder extends from 2·4 in. (6 cm.) below the upper edge of the symphysis to 1·8 in. (4·5 cm.) above the same. Its walls are in apposition behind the symphysis—except the lowest part; above the symphysis they are separated by urine to the extent of ·6 in. (1·5 cm.).

We see in this section, therefore, these two remarkable features: reflection of the peritoneum ½ in. above the brim, and also the highest point of the but moderately distended bladder 1·8 in. above the brim—and both conditions present in a patient who has been only a few hours in labour, or in labour only long enough to dilate the cervix till it admit one finger.

Dr Berry Hart's valuable inquiry into the position of the bladder in labour has shown that during the second stage we have the bladder becoming in part an abdominal organ. From the expression he uses it might be supposed that he meant that the bladder was lifted up so as to become *in toto* an abdominal organ; but all that he says is, that the bladder is above the pubes. Braune's section (on which Dr Hart based his observation) always puzzled me, for the small fragment (the size of the finger-nail) seen above the pubes could never represent the whole bladder. I took it to be the corner of the organ perhaps displaced to the right so as to be cut through only

[1] The plates of the *Atlas* were placed before the Fellows; and the vertical mesial section is reproduced in my *Atlas of the Anatomy of Labour*, Students' Edition, pl. xii.

[2] It is unfortunate that Saexinger does not record any microscopic examination of the cervix and lower segment; nor can I understand why he places the os internum where he marks it on his figure, for this makes a remarkably short cervical canal. By the time that the os externum is sufficiently dilated to admit the finger, the position of the os internum would surely be higher up.

[3] This does not represent the total length of the lower uterine segment, which extends to the line of firm attachment of the peritoneum, the latter not being shown in a frozen section.

in part, till I came to read carefully Braune's text, which at once made the matter clear. For he says, "The bladder was completely empty and pressed flat. Behind the symphysis its walls were so thin that they could scarcely be recognised. Above and *below the symphysis*, where the pressure has not affected it so much, it is broader and more easily seen."

The study of Schroeder's section and my own led me to believe that this drawing-up of the bladder could not take place till the second stage, for in both the bladder is just as low down as in pregnancy. But here we have a bladder already in the first stage a partially abdominal organ; and it is not the mere accumulation of urine which has raised the fundus, for the utero-vesical peritoneum is above the brim.

Associated with this relation of the bladder we have an unusually long and well-marked lower uterine segment. It is possible that these conditions may be the result of a peculiarity in the growth of the uterus during pregnancy; but I think we have a more satisfactory explanation in an unusual elongation of the lower segment during the first stage of labour, favoured, perhaps, by the contracted condition of the pelvis. We must wait, however, for other sections of the first stage to settle this matter.

Other points of interest in this section are that the placenta, which is divided mesially, occupies rather less than one-third of the vertical circumference of the uterus, and averages $\frac{3}{4}$ in. (1·9 cm.) thick. Further, that the posterior vaginal wall is in its upper part remarkably thin—about one-half of the thickness of the anterior at corresponding level. And, finally, that with an external conjugate of about $7\frac{1}{2}$ in. during life, we have a true conjugate of only 3·12 in.

Still more recently than Saexinger's there have been published two other sections[1] from the first stage by Dr Winter, Privat-docent of Midwifery and Assistant in the University Gynecological Clinique at Berlin. They are both from cases of eclampsia, the one a ii.-para at full time, and the other a i.-para at the eighth month. In both, pains were present some hours before death—the patient being under observation for seventeen hours in the first case, and twenty-four hours in the second. In the first case the cervix admitted the finger below, but was closed above, and in the second allowed it to pass easily through the whole canal. The special interest in these two cases centres in the placenta; and it is a curious fact that Winter in his two sections should have fallen upon illustrations of the two important pathological conditions of that organ, viz., placenta prævia and accidental hæmorrhage.

In the placenta-prævia section the placenta comes down to within four-fifths of an inch of the os internum, but is not detached, nor was there bleeding from the cervix. The membranes

[1] Reproduced in my *Atlas of the Anatomy of Labour*, Student's Edition, pl. xii.

are separated anteriorly for a little more than ½ in., *i.e.*, not quite up to the lower edge of the placenta. The striking feature in the placenta is the way in which it has been flattened by the child's head below the brim and indented by its limbs above it. Winter draws attention especially to the former point, and gives the results of his microscopic examination, which is so interesting that I quote it in full:—"In the bulky upper part of the placenta the tissue is laxer. The chorionic villi lie widely separated from each other, so that between them there is, here and there, a wide intervillous space. Between the villi there is in many places a great quantity of blood, and the bloodvessels are mostly distended with blood. . . . . The decidua serotina shows a distinct opening-out of its deeper layers, uniting it with the uterine muscle, and gives appearances such as Ruge has described as the result of the first uterine contractions in labour. In the part of the placenta in the pelvis, the chorionic villi lie very close—are thickset—and interlocked, so that one can scarcely speak of an intervillous space. Between the villi there is nowhere blood, the vessels of this part being completely empty. The decidua serotina shows here no opening-out of its deeper layers, and its limit runs almost in a straight line."

On this he bases the statement that the child may interfere with its own circulation to such a degree as materially to affect the aëration of its blood, although scarcely to a fatal extent. I do not think that he here makes sufficient allowance for post-mortem changes. When Waldezer spoke of the uterus as moulding itself on the intervertebral discs we thought that he was riding the plasticity of the uterus a little too hard, and the same must be said of the moulding of the placenta by the fœtus here. It is, however, a remarkable fact that the placenta is so very much thinner here in its lower third, although the liquor amnii is still in the uterus. That the placenta is not yet separated over the lower segment is also noteworthy, which must be taken along with the fact that the first stage is only beginning.

As to the changes immediately concerned with the first stage, we have a lower uterine segment one-half the thickness of the wall above. We have no data for determining the firm attachment of the peritoneum in a frozen section, and the thin portion will appear to be longer in this case, because the uterine wall is generally thinner at the placental site. The membranes are separated for rather more than half an inch (1·4 cm.) in front and twice that distance (3 cm.) behind. Further, the lips of the cervix are being taken up unequally, the posterior being more shortened and thinned than the anterior.

Turning now to the case of accidental hæmorrhage, we notice that while blood-stained mucus came from the cervix, there was no bleeding to speak of. The section was made of the uterus and pelvis removed from the body, and only a plate of the uterine cavity with placenta and membranes is given. The placenta has

been separated from the uterine wall by a large hæmatoma, and is detached over one-half of its site, the clot being 2·2 in. long and 1·6 in. thick, and having at one point broken through the placental tissue so as nearly to reach the fœtal surface. At the right margin it extends to the edge of the placenta, from which a thin layer of bloody serum spreads underneath the membranes downwards, dissecting the membranes off in the middle line for 2·4 in. This section, therefore, is of the first importance as giving us an anatomical basis for accidental hæmorrhage. With regard to the facts immediately concerned with the first stage, we have a lower uterine segment 2·4 in. long[1] and one-third the thickness of the wall above. Further, the membranes are separated anteriorly for 1·8 in. and posteriorly for ·4 in. Finally, the posterior lip is more taken up and thinner than the anterior.

Putting the facts in these two sections together, we find that with a further advance in the first stage in the second preparation (as indicated by the greater degree of dilatation of the cervix before death) we have a higher position of the utero-vesical peritoneum, with a greater thinning of the wall below it and a more extensive separation of the membranes. These sections, therefore, as well as that of Saexinger, bear out what I drew attention to in my own sections of the first stage, that the uterine pains during this stage are expended in thinning the lower segment of the uterus as well as in dilating the cervix; while Saexinger's shows in addition that this elongation of the lower segment may be accompanied with upward displacement of the bladder. It is noteworthy that in Winter's sections as in Schroeder's the posterior lip is being taken up more rapidly than the anterior. Schroeder considered this exceptional, while Winter would regard it as a normal occurrence. We must wait, however, for more sections to settle this point.

IV. A CONTRIBUTION TO THE NORMAL ANATOMY OF THE FEMALE PELVIC FLOOR.

By JOHNSON SYMINGTON, M.D., F.R.S.E., Lecturer on Anatomy, Minto House, Edinburgh.

THE importance and variety of the functions performed by the pelvic floor, no less than the frequency with which its structures are impaired, render an accurate knowledge of its anatomy and physiology an essential preliminary to the scientific study of gynæcology and obstetrics; yet, with the exception of Dr Berry Hart,[2] few writers have devoted much time to the investigation

[1] This distance from the os internum represents the reflection of the peritoneum in the plate, and is also the distance of the firm attachment according to Winter.

[2] (*a.*) *The Structural Anatomy of the Female Pelvic Floor.* Edinburgh, 1880; and (*b.*) *The Topographical and Sectional Anatomy of the Female Pelvis.* Edinburgh, 1885.

of its general topography, or of the changes that may occur in the position of its different parts under various physiological conditions.

One of the most obvious functions of the pelvic floor is that of supporting the superimposed viscera. This is especially the case in the human subject, for the weight of the abdominal viscera, which in most mammals is largely borne by the ventral wall of the abdomen, tends to become transferred, with the assumption of the erect posture, from this wall to the pelvic floor. The pelvic floor is not, however, merely an organ of support, since it contains canals by means of which the urinary, genital, and alimentary tracts communicate with the exterior, and through which the contents of the bladder, uterus, and rectum can pass to the exterior. In the process of parturition the floor must be capable of very great displacement, as the diameters of the fœtal head are nearly equal to those of the pelvic outlet.

In this paper the term "pelvic floor" includes not merely its muscular diaphragm, but the whole of the soft structures that close the inferior outlet of the female pelvis. It is composed of skin, mucous membrane, fasciæ, muscles, and fat, arranged in such a manner as to form a thick and tolerably compact mass. There is no difficulty in defining the lower limit of the pelvic floor, as all will readily admit that this is formed by the skin. With the upper boundary the case is different, since here the difficulty is to determine whether certain organs, which are connected with the pelvic floor, ought to be considered as entering into its formation or as resting upon it. Thus Dr Berry Hart describes the bladder as forming an important part of the anterior portion of the pelvic floor, and Dr Henry C. Coe, in his article on "The Anatomy of the Female Pelvic Organs," in the *American System of Gynæcology*, vol. i. p. 222, published in 1887, stated that, properly speaking, the term includes both bladder and rectum.

For various reasons I feel compelled to differ from these authors, and to consider that the rectum and bladder, like the uterus, should not be regarded as parts of the pelvic floor, but as organs resting upon it. Dr Hart has specially emphasized the fact, that the pelvic floor forms a compact mass, which is traversed by certain "clefts" or "faults," the walls of these clefts being normally in contact, so that they bound merely potential spaces. I quite agree with this view, but would add, that although these clefts may open up for the passage of material through them, they do not act as reservoirs like the cavities of the bladder, uterus, and rectum. If we regard the bladder as constituting a part of the pelvic floor, then we must admit that the floor rises up into the abdomen when the bladder is distended.

In addition to the ordinary methods of dissecting, the pelvic floor has been studied mainly from vertical mesial sections of the pelvis. Such specimens, although of undoubted value, afford only

a limited view of the floor, and require to be supplemented by transverse sections in order to ascertain its lateral relations. With the exception, however, of those by Dr Hart, very few drawings of such sections have been published. Even the sections given in Hart's more recent work[1] are not well adapted for showing the thickness and connexions of the anterior part of the floor, for his transverse sections were made in the direction of the axis of the inlet of the pelvis, and consequently divided the pelvic floor very obliquely. Thus all the drawings he gives of axial coronal sections pass through the lower part of the floor behind the anus (see plates v., viii., ix., and x.) In order to obviate this objection, I made a series of transverse sections of a female pelvis in which the floor was divided at about a right angle to its upper and under surfaces. In this paper I propose to describe the specimens prepared in this way, and then to consider the general structure of the pelvic floor.

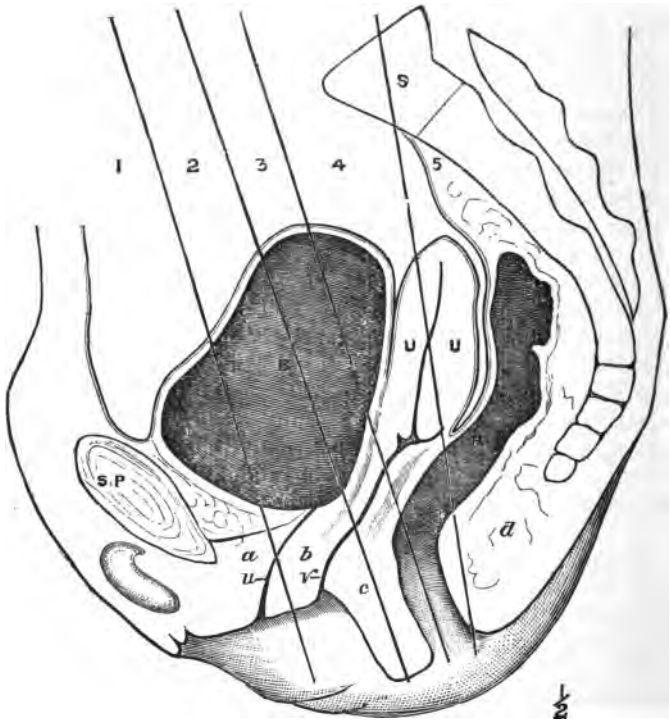

FIG. 1.—*S P*, Symphysis pubis; *S*, First piece of sacrum; *B*, Bladder; *a*, Anterior urethral wall; *b*, Urethro-vaginal septum; *c*, Perineal body; *d*, Ano-coccygeal body; *u*, Urethra; *v*, Vagina; *u u*, Uterus.

The subject upon which the sections were made was a female, aged 54, who died from cardiac and pulmonary disease. The

[1] *Op. cit.*, 1 (*b*).

abdominal and pelvic organs were healthy. The entire body was frozen; and after the abdomen had been divided at about the level of the umbilicus, and the thighs in their upper thirds, the pelvis was cut into five slabs. The direction and position of the cuts will readily be understood from an examination of Fig. 1, which represents a construction of a mesial section of this pelvis. The four straight lines crossing the figure from above downwards and backwards indicate the position of the sections in the mesial plane, and the five slabs into which the pelvis was divided by these sections are numbered from before backwards 1, 2, 3, 4, 5.

The *first section* is seen to have passed through the bladder, urethra, pudendal cleft, and labia majora and minora. The urethra was divided somewhat obliquely about the middle of its length. The section is $\frac{1}{4}$ of an inch behind the external orifice of the urethra, and about the same distance in front of its vesical opening. It is farther from the symphysis pubis above than below, being $1\frac{1}{2}$ inches behind its upper border, and $\frac{5}{8}$ths of an inch behind its lower end. The section is a trifle farther back on the right side than on the left. On the right side it goes through the anterior superior and inferior iliac spines, while on the left side it is immediately in front of these processes.

The structures forming the pelvic floor and the lateral walls of the true pelvis in the plane of this section are shown in Fig. 2,

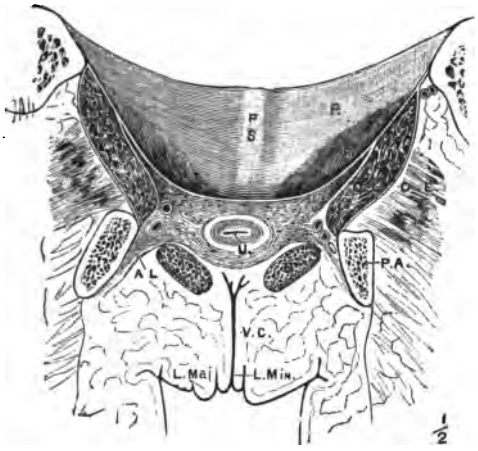

FIG. 2.—P.A., Pubic arch; P.S., Pubic symphysis; P., Body of pubis; O.I., Obturator internus muscle; O.E., Obturator externus muscle; A.L., Anterior layer of triangular ligament; U., Urethra; V.C., Vulval cleft; B., Vestibular bulb.

which is a view of the posterior aspect of No. 1 slab after the removal of some coils of the intestines, of the bladder with its peritoneal reflections, and of the retro-pubic fat. The portion of the bladder in this slab was connected with the pelvic wall by the reflections of the peritoneum. It is important to observe that

below these folds of the peritoneum the bladder was attached to the back of the pubes and also to the pelvic fascia merely by loose cellular tissue and fat, so that it could easily be separated from them with the handle of a knife.

The lateral walls of the true pelvis are divided opposite the obturator foramina. Above the foramen, on each side, the pelvic brim is cut at the outer extremity of the ascending ramus of the pubis; while, below the foramen, the pubic arch is divided near the upper end of the ascending ramus of the ischium. The lateral wall is completed by the obturator membrane, covered on its inner aspect by the obturator internus muscle and the obturator or parietal layer of the pelvic fascia.

The part of the pelvic floor exposed in the plane of this section is about 2 inches in thickness, and the floor maintains this depth as far forwards as the pubic symphysis. The lower half of the floor is divided into two lateral halves by a deep mesial cleft, which divides above into two short limbs. The upper half is traversed by the urethra, which appears as a transverse slit about $\frac{1}{4}$ of an inch in length.

The upper boundary of the portion of the pelvic floor seen in this slab is formed by a layer of the pelvic fascia, which is attached at the sides to the obturator fasciæ, and in front to the back of the pubes. Its upper surface is pierced just behind the pubic symphysis by a vein, but otherwise it forms a continuous layer. A short distance on either side of the middle line the floor is thickened by fibres going from the pubis backwards to the bladder. These fibres form the anterior true ligaments of the bladder; beneath them there are a few muscular fibres having the same direction and connexions. From this layer of pelvic fascia downwards to the anterior layer of the triangular ligament and the vestibular bulbs there is a firm mass of tissue, composed of part of the origins of the levatores ani, of the posterior layer of the triangular ligament, and of the muscular fibres surrounding the urethra. If, in this specimen, which I now show you, the thumb be passed into the pudendal cleft and the forefinger above the pelvic fascia, and the tissue between them grasped by these digits, it will be at once evident that this part of the pelvic floor is firmly attached both in front and at the sides.

On each side of the pudendal cleft there is a large mass of fat, which extends upwards between the bulbo-cavernosus muscle covering the bulb and the erector clitoridis muscle lying superficial to its crus. This fat is continuous with that on the inner side of the thighs. Below, the floor is bounded by the skin of the labia majora. In this specimen they are somewhat atrophied, allowing the labia minora to be visible (vulva hians).

I have given a detailed description of this slab, as I consider it demonstrates a very different condition of the anterior part of the pelvic floor from that described by Dr Hart. I have already ex-

pressed my dissent from the view of Hart, that the bladder forms part of the pelvic floor. You are, of course, aware that he divides this floor into two parts, which he designates the pubic and sacral segments. The pubic segment is described as having a loose attachment in front. I quite admit that this is the case with the bladder, but it is not so with the structures lying below the bladder. Indeed, in my opinion, the anterior part of the pelvic floor is composed of as firm tissue, and is connected as strongly with the anterior part of the pelvic wall, as is the sacral segment with the sacrum and coccyx.

The *second section* is about an inch posterior to the one just described. It passes through the bladder, vagina, perineal body, and fat of ischio-rectal fossæ. In this section the transverse diameter of the inlet of the bony pelvis is 4½ inches, and that of the outlet, which is bounded by the ischial tuberosities, is 3½ inches. The obturator muscles lying internal to the osseous lateral walls diminishes considerably the transverse diameter of the pelvic cavity, so that opposite the thickest parts of these muscles it

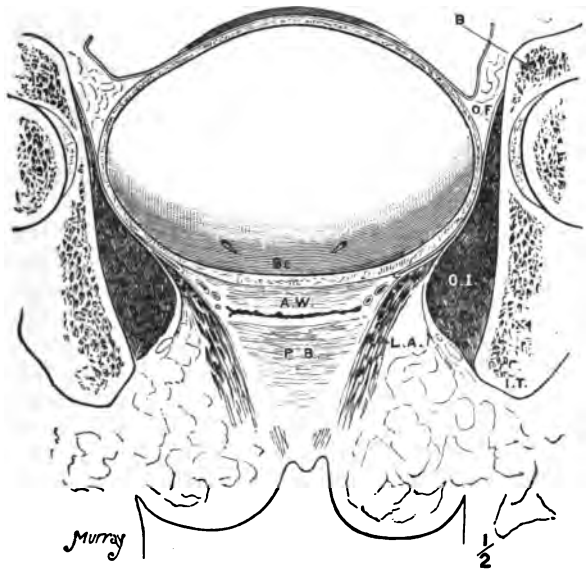

FIG. 3.—B., Brim of true pelvis; I.T., Ischial tuberosity; O.I., Obturator internus; O.F., Obturator fascia; L.A., Levator ani; P.B., Perineal body; A.W., Anterior wall of vagina; BL., Trigone of bladder.

measures only about 2½ inches. The base of the bladder is divided about midway between the openings of the ureters and the internal orifice of the urethra. This part of the bladder lies upon the anterior wall of the vagina, with which, however, it is only loosely connected. The vagina appears as a transverse slit about 1½ inches in length.

It will be remembered that in No. 1 section the pudendal or vulval cleft was situated in the middle line, and was about an inch in depth. At its upper part this mesial cleft divided into two limbs about $\frac{3}{8}$ths of an inch long. In order to show the relation between the mesial pudendal and the transverse vaginal clefts, the second slab, after the removal of its bony walls, was embedded in collodion and then cut into a number of thin slices.[1] The series of sections obtained in this way show that as the vulval cleft passes backwards towards the vagina its two limbs increase in length and become more horizontal. Ultimately the vertical cleft is bounded posteriorly by the perineal body, and its two limbs become continuous with the vagina.

Fig. 3 represents a view from the front of the third slab. From this drawing it will be seen that the pelvic floor, in the plane of this section, is formed by a part of the pelvic fascia, the levatores ani, the perineal body, and the fat of the ischio-rectal fossæ with the integument below.

In the first section (see Fig. 2) we saw that the pelvic fascia passed uninterruptedly across the pelvis from one side to the other, and formed a well-defined upper boundary to the pelvic floor. This is not the case in this section, since the direct continuity of the fasciæ on the two sides is interrupted by the presence of the bladder and vagina. The layer of fascia attached externally to the parietal or obturator fascia, and going downwards and inwards on the inner aspect of the levator ani, becomes connected with the bladder at the side of its base, and is often called the lateral true ligament of the bladder. This ligament is connected with one layer of fascia running upwards and outwards on the side of the bladder, and with another, which goes downwards and inwards on the inner side of the levator ani, passing close to the lateral angle of the vagina and becoming lost in the perineal body. There is no distinct sheet of fascia passing inwards between the bladder and vagina, but these organs are connected by loose cellular tissue. The posterior vaginal wall is closely adherent to and may be said to form part of the perineal body. In this position I am inclined to regard the floor as bounded above by the fascia, covering the inner aspect of the levator ani, and by the posterior vaginal wall. The anterior vaginal wall might be included in the floor, still I prefer to consider the portions of the anterior vaginal wall and the base of the bladder exposed in this section as being immediately above the floor, but attached to it at the urethro-vaginal septum (see Fig. 1).

The *third section* is about half an inch behind that just described. In it the osseous pelvis is cut about $1\frac{1}{2}$ inches behind the anterior superior iliac spines, just posterior to the acetabula and at the back part of the ischial tuberosities. The section

[1] I am indebted to Dr Woodhead for permission to make these sections in the Laboratory of the College of Physicians.

goes through the posterior portion of the bladder, the upper part of the vagina, the termination of the rectum, and the whole length of the anal canal. In the plane of this section, and this was also the case in the second section, the vesical and vaginal walls are connected by loose cellular tissue. The posterior vaginal wall, however, instead of being blended with the perineal body, lies upon and is separated from the anterior rectal wall by some adipose tissue. I have already stated that I consider both the bladder and rectum to be situated above the floor, and would also add that the same is the case with the upper part of the vagina. Below the termination of the rectum the pelvic floor is traversed by the anal canal. I described the shape and relations of this canal in a paper on the "Rectum and Anus," which was published in the *Journal of Anatomy and Physiology* for Oct. 1888. The subject may be briefly referred to here, as it involves the question of the relations of the pelvic floor at the anus.

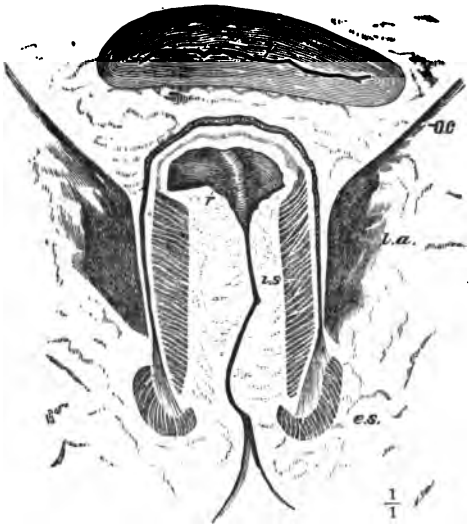

FIG. 4.—*v.*, Vagina; *r.*, End of second part of rectum; *i.s.*, Internal sphincter; *e.s.*, External sphincter; *l.a.*, Pubo-coccygeus part of levator ani; *o.c.*, Obturator-coccygeus. The interval between the levator ani and external sphincter was less than that represented in this woodcut.

Fig. 4 is a drawing of part of the posterior aspect of No. 3 slab, that is the anterior of the two surfaces exposed by the third section. The structures represented are the vagina, the rectum, the anal canal, the sphincters of the anus, and the levatores ani. It will be seen that the lateral walls of the anal canal are in contact. The muscles lying at the sides of this canal are the two sphincters and the pubo-coccygeus portion of the levatores ani. External to these structures the pelvic floor is formed by a thin layer of muscular fibres, *i.e.*, the obturator-coccygeus (Savage) part of levator ani. Above these fibres is a layer of the recto-vesical

fascia, and below them the anal fascia and the fat of the ischio-rectal fossa.

The *fourth section* through this pelvis is not parallel with the third section, the slab between them being much thicker above than below (see Fig. 1). This section goes through the first piece of the sacrum and the sacro-iliac joints, and lower down divides the ischial spines. It is posterior to the ischial tuberosities, but cuts across the great sacro-sciatic ligaments. The viscera divided are the rectum and uterus.

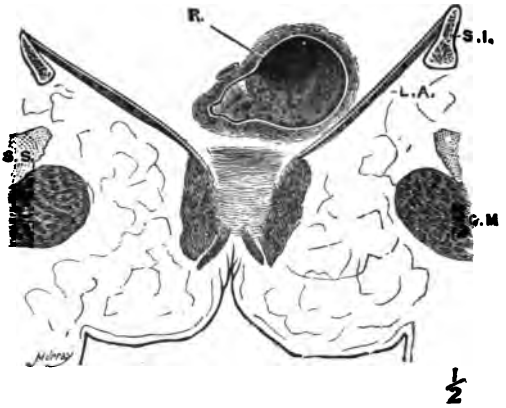

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FIG. 5.—S. I., Spine of ischium; S.S., Great sacro-sciatic ligament; G.M., Gluteus maximus; L.A., Levator ani; R., Rectum.

Fig. 5 shows a part of the anterior aspect of the fifth slab. The upper surface of the pelvic floor is seen to be concave from side to side, and to extend from one ischial spine to the other. The rectum rests upon it, but is only loosely attached to it. The pelvic floor is here divisible into a central and two lateral portions. The central portion is composed of the muscles which in the previous section were found at the sides of the anal canal, viz., the internal and external sphincters of the anus and the pubo-coccygei portions of the levatores ani. The mass of tissue between the anal canal and the coccyx may be called the ano-coccygeal body. If it be divided by a series of transverse sections passing from above downwards and backwards, it will be found to become less muscular as the coccyx is approached, the muscular fibres being replaced by fibrous tissue and fat. The lateral portions of this part of the pelvic floor are formed mainly by fat. This fat, however, is bounded above by some fibres of the levator ani and a layer of the pelvic fasciæ, while towards its lower part the floor is strengthened by the gluteus maximus muscle. The relations of this muscle to the posterior part of the pelvic floor is well shown in plates ix., x., and xi. of Hart's *Contributions to the Topographical and Sectional Anatomy of the Female Pelvis.*

Most of the important points connected with the anatomy of the female pelvic floor will be found to have been alluded to in connexion with the account of the series of sections just described. Some of these, however, have only been incidentally mentioned, and will now be considered more fully.

In the mesial plane the pelvic floor is, as a rule, about an inch thick. At the sides it varies in different situations, but it is always thicker than in the middle line, and near the lateral wall of the pelvis is generally from two to three inches in thickness. Its comparative thinness in the middle line is partly due to its upper surface being generally concave from side to side, but it is mainly owing to the presence of a median fissure on the under surface extending from the front of the pubes, below the mons veneris, backwards as far as the posterior aspect of the coccyx. The lateral walls of this median depression are formed mainly by skin, and their degree of apposition depends largely upon the position of the thighs, whether abducted or adducted. In front of the perineal body and between the labia majora this median fissure is known as the pudendal or vulval cleft, while behind it forms the natal cleft, being situated between the two nates. The vulval cleft opens below between the labia majora. It is bounded above in the middle line (see Fig. 1) by the glans clitoridis with its prepuce, by the tissue between the glans and the orifice of the urethra, and by the lower edge of the urethro-vaginal septum. In front of this septum is the orifice of the urethra and behind it the entrance to the vagina. The posterior boundary is the anterior aspect of the perineal body, the lower part of which, on lateral traction, presents a transverse fold—the fourchette. The depression above the fourchette and below the entrance to the vagina is known as the fossa navicularis. On the lateral walls of this fissure are the labia minora, which, beginning in front at the clitoris, may extend backwards to the fourchette. The labia minora appear to me to vary, not only in their length, but also in the distance of their attachment from the lower opening of the vulval cleft. According to Hart,[1] both labia majora and minora are composed of skin, and on the inner side of the base of the labium minus is a white line indicating the junction of skin and mucous membrane, so that below this line the walls of the vulval cleft are formed by skin and above it by mucous membrane. The part of the vulval cleft bounded by mucous membrane corresponds to what is often called the vestibule.

The lateral walls of the vulval cleft are usually in contact even when the thighs are abducted. There is, however, no muscular tissue to maintain them in apposition. An examination of the section represented in Fig. 2 shows that external to the integument these walls are composed mainly of fat, which, however, is traversed by a number of fibrous and elastic bundles. At the

[1] *Edin. Med. Journal*, September 1882.

sides of the upper part of the cleft the vestibular bulbs intervene between the mucous membrane and the fat (see Fig. 2).

In addition to the vulval and natal clefts there are three slits in the pelvic floor, viz., the urethra, the vagina, and the anal canal. The two former open below into the vulval cleft, and the latter into the natal cleft.

The urethra is a small transverse fissure which does not to any appreciable extent weaken the floor. The vagina in the greater part of its extent is in the form of a transverse slit, so that its walls are anterior and posterior, and lie in close apposition. In the female pelvis, described in this paper, the breadth of the vagina was $1\frac{1}{2}$ inches a little below the middle of its length, and $\frac{3}{4}$ of an inch nearer the os uteri externum it was a trifle narrower. Its anterior and posterior walls are described as triangular, with the base upwards and the apex at the introitus. It must be remembered, however, that the apex is very blunt, and that the diminution in the transverse diameter of the vagina near its lower end is to a great extent compensated for by certain foldings of the vaginal walls in this situation. The vaginal slit is undoubtedly the main source of weakness in the female pelvic floor. Owing, however, to the fact that it passes very obliquely from below upwards and backwards, the general effect of the intra-abdominal pressure is to press its anterior wall against the posterior (Hart). Only about the lower half of the vagina is in the pelvic floor, the upper portion being above the floor.

The anal canal is an antero-posterior slit situated between the perineal and ano-coccygeal bodies. It is about an inch in length, and cuts the pelvic floor at nearly a right angle to its antero-posterior axis. This axis in the posterior part of the floor is directed forwards and downwards, while the anus runs downwards and backwards. Intra-abdominal pressure, therefore, will tend to open rather than close this canal. This source of weakness in the pelvic floor is compensated for by the relation of the lower end of the rectum to the anus, and by the presence of powerful sphincter muscles. The anal canal is normally merely an antero-posterior slit, while the lower end of the rectum has a distinct transverse diameter, so that the anterior rectal wall or the contents of the lower end of the rectum will be supported by the tissues at the sides of the canal.

In the mesial plane the pelvic floor is formed from before backwards by the anterior urethral wall and the tissue connecting it with the lower part of the pubic symphysis, by the urethro-vaginal septum, by the perineal body, and by the ano-coccygeal body. Mesial sections are not well adapted for displaying the connexions of the anterior part of the pelvic floor with the anterior wall of the pelvis, as the pubo-vesical and triangular ligaments are not so well developed in the mesial plane as they are a short distance on either side of that plane.

The upper limit of the pelvic floor can easily be defined and separated from the pelvic viscera, both in front and behind. Thus from the pubes backwards nearly to the urethral orifice the floor is bounded above by the pelvic fascia, which is separated from the bladder by loose fat and areolar tissue. Again, from the coccyx forwards, nearly as far as the anal canal, the rectum is separated from the floor by loose cellular tissue and fat. Between these points, however, the attachment of the pelvic viscera to the floor is more intimate. Thus in a mesial section the anterior urethral wall is seen to be continuous with the anterior wall of the bladder. Behind the urethra the firm mass of tissue forming the urethro-vaginal septum is continuous above with the base of the bladder and with the upper part of the anterior vaginal wall. The perineal body in a similar manner is connected above with the upper part of the posterior vaginal wall and the anterior rectal wall, while behind the anal canal the posterior wall of the lower end of the rectum is continuous with the anterior part of the ano-coccygeal body. Between the lateral wall of the pelvis and the bladder, vagina, and rectum, the pelvic floor is limited above by the layer of pelvic fascia stretching from the side wall of the pelvis to the above-mentioned viscera.

The most important muscles in the pelvic floor are the levatores ani, but the accounts of their arrangement and functions will be found to differ greatly. Savage[1] divides each levator into two portions, which he names the pubo-coccygeus and the obturator-coccygeus. I believe that these two portions differ not only in their arrangement but also in their function. The pubo-coccygeus arises from the posterior surface of the pubis and the posterior layer of the triangular ligament. Its fibres pass backwards on the side of the lower part of the vagina, and on the side of the anal canal to the last two pieces of the coccyx. A few of its innermost fibres turn inwards in the perineal body in front of the internal sphincter of the anus. Behind the anus, and in front of the coccyx, there is a partial blending of fibres of opposite sides in the middle line.

The pubo-coccygei act as sphincters of the lower part of the vagina and of the anal canal, but they cannot compress the upper part of the vagina nor the rectum. They also draw upwards and forwards the perineal body and coccyx.

The obturator-coccygeus consists of those fibres of the levator ani that arise from the pelvic fascia between the pubis and the ischial spine. Its fibres run backwards and inwards to the coccyx. These fibres have no direct action upon any of the pelvic viscera. They constitute a thin layer of fibres, which, in addition to raising the coccyx, can elevate the pelvic floor a little after it has been depressed.

[1] *The Surgery, Surgical Pathology, and Surgical Anatomy of the Female Pelvic Organs.* 5th edition. London, 1882.

The sphincters of the anus are shown in Fig. 4, and do not call for any special notice.

The bulbo-cavernosus seen in Fig. 2 is sometimes called the sphincter vaginæ. Taking its fixed point in front it may have a slight influence in drawing forwards the perineal body, but its main function is evidently the compression of the vestibular bulb, and it certainly does not exert any appreciable influence upon the lumen of the vagina.

An examination of the series of coronal sections already described will show that fat enters very largely into the construction of the pelvic floor, for in all of them a large wedge-shaped mass of fat is seen on each side. The apex of the wedge is directed upwards towards the pelvis, and the base is connected with the skin forming the inferior boundary of the pelvic floor. These masses of fat evidently act as elastic cushions supporting the structures internal to them, but capable of displacement and compression in order to allow of the opening up of the slits in the pelvic floor.

When the thigh is adducted, a groove is found extending from before backwards between the labium majus and the inner side of the thigh. Except in thin subjects, the bottom of this groove is directed upwards and outwards, so that the labium majus rests partly upon the inner side of the thigh, which thus assists in closing the vulval cleft and supporting the pelvic floor.

The special purpose of this communication has been to state the results of my own investigations on the normal topographical anatomy of the female pelvic floor, but before closing I would briefly compare them with those of Dr Berry Hart on this subject. In his work on *The Structural Anatomy of the Female Pelvic Floor*, published in 1880, he proposed a division of the pelvic floor into two parts, viz., an anterior or pubic segment, and a posterior or sacral segment, separated from one another by the vaginal cleft. He held that this division was based on differences in their anatomical structure and function, and he compared them as follows (p. 12):—

"The pubic segment of the pelvic floor is thus loose in texture, has only a loose bony attachment anteriorly, and will evidently permit of mobility in an up or down direction."

"The sacral segment of the pelvic floor is strong in structure, has a strong dovetailed attachment to the sacrum, and is only movable downwards, with, of course, a recoil upwards, when it revolves round the sacrum and coccyx as a centre."

I consider this division of the floor to be a very convenient one, but my own investigations have failed to convince me of the existence of the marked contrast between the two segments described by Dr Hart. I should say that the texture of the pubic segment is on the whole as compact, if not more so, than that of the sacral. Then, again, with regard to their attachments, the pubic segment is undoubtedly firmly attached to the pubic

arch, while I have failed to find any strong dovetailed attachment of the floor to the sacrum and coccyx.

It should be noticed that Dr Hart puts the bladder in the pubic segment. This organ is undoubtedly loosely connected with the anterior wall of the pelvis, and his description would be correct were the bladder the only structure forming the pubic segment. I do not consider it a part of the floor, but even though it be regarded as such, Dr Hart's description is not applicable to the part of the pubic segment situated below the bladder.

Dr Hart has further endeavoured to show that during labour, when the pelvic floor is opened up for the passage of the child

FIG. 6.—Drawing reduced by photography from Table C in Braune's Atlas—*Die Lage des Uterus und Fœtus am Ende der Schwangerschaft* (HART).

through it, the pubic segment is drawn upwards, and the sacral pushed downwards and backwards. He compares the process to passing through two swinging bank-doors. "One half is pulled towards the passenger, the other is pulled from him." In a Society such as this, I am reluctant to venture an opinion on a subject regarding which I have no clinical experience. As, however, Dr Hart bases his very ingenious theory largely upon Braune's section of a woman in labour, I may be permitted to state that Braune's drawing does not appear to me to warrant the deductions Hart has drawn from it. The plate (see Fig. 6) seems to me to show that the pubic segment (*f*) is pushed downwards and forwards under the pubic arch. The urethra may be somewhat

increased in length, but it lies mainly below the pubic arch. The bladder is the only part of Hart's pubic segment that is not depressed. It is partly flattened up against the symphysis, while a small portion (*e*) lies above it.

In a future communication I hope to have the opportunity of bringing before this Society the results of some investigations upon the pathological anatomy of the pelvic floor.

V. THE NATURE AND AIM OF INVESTIGATIONS ON THE STRUCTURAL ANATOMY OF THE FEMALE PELVIC FLOOR.

By D. Berry Hart, M.D., F.R.C.P.E., F.R.S.E., Lecturer on Midwifery, Surgeons' Hall, Edinburgh, etc.

For some years past I have published various communications on what I termed the structural anatomy of the female pelvic floor. To-night I wish to define the scope of these researches, to consider some criticisms advanced by others, and to indicate whether or not the opinions advanced have been modified by fresh facts.

This subject will best be considered under the following heads:—

I. *The Aim of Structural Anatomy.*
II. *The Methods of Investigation necessary.*
III. *The Result attained by it.*

I. *The Aim of Structural Anatomy.*—This necessitates, in the first place, a definition of what we mean by the term "Pelvic Floor." As the structural anatomy has its special bearing on the functions of the pelvic floor, it is to be defined so as to satisfy clinical and not dissectional requirements. The abdominal cavity has its inner aspect defined by peritoneum, and therefore I would define the upper aspect of the clinical pelvic floor by the peritoneum covering it, the uterus and appendages being removed of course. For similar clinical reasons the skin of the genitals and parts adjacent define its outer aspect. This gives the pelvic floor the obstetrician has to deal with.

The aim of structural anatomy is to study the mechanism of this pelvic floor, so as to understand the changes taking place in it during labour and the alterations brought about in it by excessive intra-abdominal pressure. Its main object is, therefore, to study the mechanism of parturition and prolapus uteri, although the functions of the bladder and rectum also come up for consideration.

II. *The Methods of Investigation necessary.*—In no subject is it more necessary to have definite ideas as to methods. Inasmuch as structural anatomy is the anatomy of living function, the relation of parts must be studied in the simplest manner possible. Thus I have always used the following methods. A fresh pelvis is

frozen and sawn in definite directions. The direction of a section, so far as the structure of the pelvic floor is concerned, is of importance. The main directions must be sagittal mesial, sagittal lateral, and axial coronal. The most important are the axial coronal, inasmuch as intra-abdominal pressure acts in the axis of the pelvic inlet, and as the vagina and urethra are at right angles to it we get the proper thickness of tissue. Any obliquity of the section to the pelvic axis leads to error in estimating the relative thicknesses.

When the sections are made and drawn, the next thing is the examination. This must be limited to mere fingering, so that the lines of loose tissue may be recognised. It is often helpful to place the sections under a water-tap, so as to render these lines more evident. In doubtful points microscopic examinations should be made. The ordinary dissectional method is to be avoided, as loose tissue is cut away, the relations disturbed, and lines of cleavage artificially made. Of course dissection has its uses afterwards.

III. *The Results attained by it.*—In the female pelvic floor I described, in sagittal mesial section, a division into pubic and sacral segments, the line of junction being the vagina. The pubic segment was described as mobile, and made up of loose tissue, thus being in direct contrast to the firm sacral segment. The mobility of the pubic segment is due chiefly to its loose attachment to the pubis, where the retro-pubic fat lies. This mobility is so marked that we get the pubic segment displaced, even in the genu-pectoral posture; more markedly displaced during labour, when it is in part drawn up; and most markedly of all in prolapsus uteri.

The important displacement is the second one. I first drew attention to it in Braune's section, and since then it has been found well marked in others, viz., Chiara's, Chiari's, Saexinger's. In those of Schroeder and Barbour the labour was too slightly advanced for its production. Clinically it is easily recognised, and has been confirmed by Croom, Barbour, and many others. In Braune's section it was associated with marked thickening of the anterior uterine wall, probably because the woman died during a pain. In none other is the thickening shown, but this agrees with the facts as to the bladder brought out by me; in some the bladder is relaxed, in others contracted.

In considering the changes in the pelvic floor segments produced by the birth of the child at full time, I stated in 1880 that the pubic segment was drawn up "partly above the brim" (p. 15, *Structural Anatomy*, 1880), that this drawing up was "chiefly in the middle line" (p. 16, *ibid.*), and also that the bladder was above the symphysis, even in the first stage of labour. From the statement in one of my papers, that "only the part of the bladder above the pubis is available for the reception of urine," it will be seen that I believed that the entire bladder might not be ab-

dominal. These results were based on an examination of Braune's sagittal mesial section of a woman who died at the end of pregnancy, another where the labour had advanced to the end of the first stage, and also on Chiara's figure of a case of death during spontaneous evolution of the fœtus. Since that time several sections, both of pregnant and parturient women, have been issued, and we have, in addition, more sections of the pelvis of the non-gravid. There is thus abundance of fresh material for considering the whole question once more, and testing whether the statements made in my thesis are still borne out. To settle this question anatomically we have to consider—

A. *The relation of the vagina to the conjugate in the non-gravid and gravid woman.*

B. *The relation of the os internum uteri and lower uterine segment to the conjugate in the gravid and parturient woman.*

C. *The action of the retracting uterine muscle on the pelvic floor segments.*

A. *The relation of the vagina to the conjugate in the non-gravid and gravid woman.*—The vaginal axis in sagittal mesial section is the most convenient topographical line to select, as it is always cut on section, is the boundary line of the pubic and sacral segments, and has a perfectly definite relation to the conjugate. In the non-gravid pelvis it will be found that the vaginal slit in sagittal mesial section lies parallel to the conjugate and 2½–3 inches below it. This distance is easily determined by joining the conjugate and vaginal parallels by perpendiculars. In the sections of gravid women at full time (Braune's, Winter's) the same facts hold good, except that the vagina lies on an average of 3 to 4 inches below the conjugate.

The important fact now to be noted is that in a parturient section the vaginal axis of the end of pregnancy can be approximately determined by drawing a parallel to the conjugate 3½ inches below it. This enables one to see the changes in the segments induced by labour.

B. *The relation of the os internum uteri and lower uterine segment to the conjugate in the gravid and parturient woman.*—In the sections of Braune, Waldeyer, and Winter, the os internum is below the conjugate. This is best seen in Waldeyer's section, where, however, a fracture of the pelvis has elevated the parts somewhat. If we take the length of the lower uterine segment as 2 inches, we find further that the upper boundary of the lower uterine segment is also below the conjugate. It may therefore be broadly stated that at the end of pregnancy the lower uterine segment, os internum, cervical canal, and pubic segment are pelvic, *i.e.*, there is no projection of these above the conjugate.

If, now, we take the parturient sections of Braune, Chiari, Chiara, and draw on them the approximate vaginal axis at the end of the pregnancy, we find that the pubic segment is above its level,

the sacral segment below. This is marked in Braune's section, more marked in Chiari's, and most of all in Chiara's.

But a further point to be noted is as follows. The upper boundary of the distended lower uterine segment is the retraction ring, otherwise known as contraction ring. If we look at the canalized lower uterine segment and cervix in the three parturient sections already quoted, we find the ring at the level of the promontory behind, but 2 inches above the symphysis in front. The vertical diameter between retraction ring and os externum is the same behind as in front, so that it is evident the higher portion in front is due to the higher position of the pubic segment. This displacement is given in detail in Braune's section, where we find bladder, peritoneum, and retro-pubic fat all higher. Braune's drawing is so accurate that there can be no doubt to any eye accustomed to such work; while Chiari's section also shows the peritoneum off the distended and high bladder. In Chiara's section only a small portion of the bladder is not in the abdomen.

While the higher positions of the pubic segment during labour cannot be denied, it has been urged that it is only the bladder that is high, and that further the bladder may be regarded as pushed up, not drawn up. As a mere matter of observation, however, it is not only the bladder but the pubic segment that is drawn on. Indeed the longitudinal uterine muscle directly passes to the cervix, and the cervix to the vaginal walls, which bound and form part of the segments. Traction on them is therefore direct, and the bladder is only indirectly drawn up by its attachment to the cervix and that of the urethra to the anterior vaginal wall.

That the pubic segment, however, is drawn up and not pushed up is evident when we come to consider—

C. *The action of the retracting uterine muscle on the pelvic floor segments.*—Under this part I wish briefly to consider the method of action of the uterine muscle during labour as well as notice some sections of early labour not yet alluded to.

The dilatation of lower uterine segment, cervical canal, and pelvic floor is accomplished by the upward tension exercised by the longitudinal bundles of muscle during retraction and the dilating power of the fœtus. It is important to note that the round ligaments and utero-sacral folds at any rate, into which longitudinal bundles pass, give, as it were, external fixed points for uterine action. During the pain these external points seem to steady the uterus, and allow of the drawing up by the special bundles passing to the cervix. In the early stages of labour, before full dilatation can occur, the pelvic floor is depressed or bulged down, as Schroeder and Barbour's sections show. When, however, complete canalization has taken place, the upward tension of uterine retraction pulls up the pubic segment and gives it the higher position already pointed out. Were it not, indeed, for the upward tension exercised by the uterine muscle there would be for a certainty depression and

eversion of the pubic segment before the advancing head. I see, therefore, in all recent sections abundant confirmation of the facts already given in my thesis of 1880, and I maintain still that the pubic segment, in which I of course include the bladder, is drawn up in part into the abdomen during labour; that this is most marked in the second stage of labour; that even in the early part of the first stage the bladder is drawn up as the dilatation of the lower uterine segment begins (Saexinger's section).

In sagittal mesial section a very important line of loose tissue lies between posterior vaginal wall and anterior rectal one. It is here that the posterior boundary of displacement in prolapsus uteri lies. To investigate this subject more fully I made axial coronal sections, and in this way gained fuller information. I found loose tissue separating the pelvic fascia from the organs within it, viz.—bladder, vagina, and anterior wall of rectum. As the drawing up of the pubic segment was a displacement of only part of this portion lying within the pelvic fascia, I considered it advisable to add to the nomenclature by using the terms "entire displaceable" and "entire fixed" segments. The entire displaceable segment is the bladder and urethra with the vaginal walls. The entire fixed portion comprises the tissues lying beyond the pelvic fascia. This is a terminology highly useful, as it puts the matter of so-called prolapsus uteri thus,—"Prolapsus uteri is a displacement of the 'entire displaceable' portion past the 'entire fixed' portion."

The "entire fixed" portion coincides exactly with the pelvic floor of some anatomists. In the axial coronal sections one can see the loose side relations of the pubic segment, and also how, beneath the pubic arch, it is fixed by fascia and muscles. This fixation I also found in microscopical sections.

In a recent communication Dr Symington has criticised the conclusions I came to in 1880 in the following terms:—

"I consider this division of the floor to be a very convenient one, but my own investigations have failed to convince me of the existence of the marked contrast between the two segments described by Dr Hart. I should say that the texture of the pubic segment is on the whole as compact, if not more so, than that of the sacral. Then, again, with regard to their attachments, the pubic segment is undoubtedly firmly attached to the pubic arch, while I have failed to find any strong dovetailed attachment of the floor to the sacrum and coccyx.

"It should be noticed that Dr Hart puts the bladder in the pubic segment. This organ is undoubtedly loosely connected with the anterior wall of the pelvis, and his description would be correct were the bladder the only structure forming the pubic segment. I do not consider it a part of the floor, but even though it be regarded as such, Dr Hart's description is not applicable to the part of the pubic segment situated below the bladder.

"Dr Hart has further endeavoured to show that during labour, when the pelvic floor is opened up for the passage of the child through it, the pubic segment is drawn upwards, and the sacral pushed downwards and backwards. He compares the process to passing through two swinging bank-doors. 'One half is pulled towards the passenger, the other is pulled from him.' In a

Society such as this, I am reluctant to venture an opinion on a subject regarding which I have no clinical experience. As, however, Dr Hart bases his very ingenious theory largely upon Braune's section of a woman in labour, I may be permitted to state that Braune's drawing does not appear to me to warrant the deductions Hart has drawn from it. The plate (see Fig. 6) seems to me to show that the pubic segment (*f*) is pushed downwards and forwards under the pubic arch. The urethra may be somewhat increased in length, but it lies mainly below the pubic arch. The bladder is the only part of Hart's pubic segment that is not depressed. It is partly flattened up against the symphysis, while a small portion (*e*) lies above it."

Dr Symington has evidently taken his views of the texture of the pubic segment from spirit preparations. In fresh preparations, however, its looseness and laxness are quite evident. Apart from this, it is recognised clinically by every gynecologist during the performance of the bimanual. Through the pubic segment the examiner can feel and map out the uterus, tubes, and ovaries in many cases, and can feel the finger tips of both hands easily. This is permitted by the looseness of the tissue forming this special segment, and in itself sufficiently refutes Dr Symington's statement. As to the firm attachment of the pubic segment below the pubic arch, I never denied that: in fact it is a well-known attachment recognised in prolapsus uteri, and shown in Schatz's section of prolapsus uteri (*Arch. für Gynäk.*, Bd. xiii., S. 262; also *Contributions to Topographical Anat.*)

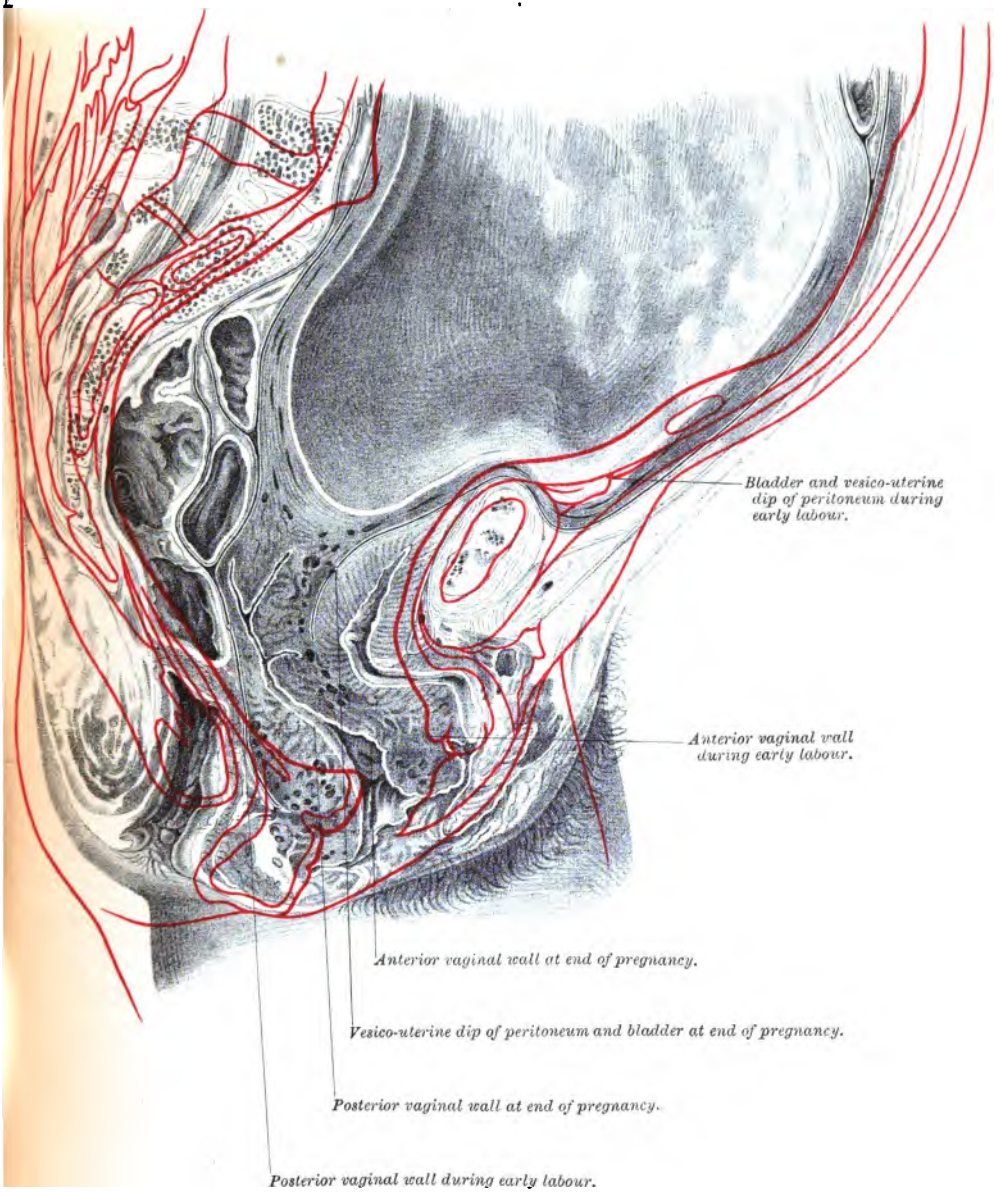
In regard to the drawing up of the pubic segment, Dr Symington's criticism is neither a correct statement of the method of research I adopted, nor a conclusion based on anything like a sufficient investigation of the subject. He states that I based my "ingenious theory largely on Braune's drawing." I may first object that there is no question of theory in the matter; it is a question of fact based on measurement. I further based my conclusions on a comparison of the three sections then published; of these, Chiara's shows the most marked displacement as yet figured, and Braune's parturient section is drawn with such accuracy that it gives more detailed anatomy of the displacement than any other. But what is most remarkable is, that Dr Symington actually gives his opinion on the displacement of the pubic segment by simple inspection of Braune's parturient section, and states "that the pubic segment is pushed downwards and forwards under the pubic arch." No one can say this from mere inspection of this section alone. One must compare it with pregnancy sections as I have done. When one does so, it is at once evident that Dr Symington's statement on this point is erroneous. Dr Symington has thus given his opinion on this point without examining all the sections published in 1880, to say nothing of the many issued since.

The term "dovetailed into the sacrum" is quite accurate, and means, in a literary sense, an attachment to both sides of a structure. If plates iii., iv., ix., and x. in my *Atlas* of 1885 be consulted it will easily be seen.

The lithographic plate shows Braune's parturient section superimposed on the pregnant section, and sufficiently explains itself.

Prof. Simpson thought the three papers which had just been read were all extremely interesting, and Dr Symington's especially would form a very valuable contribution to their Transactions. The Society and obstetricians generally were under a debt of gratitude to him for the fresh observations he had made and the clear exposition he had given of the result of his frozen sections of the pelvis. He (Prof. Simpson) hoped Dr Symington would have the opportunity of making further sections, perhaps of the pelves of younger women, and would again favour the Society with a record of his researches. As Dr Hart had indicated, it would add to the value of such investigations to have the sections made in different directions, so as to get various views of the structure and relations of the pelvic floor. Much of the contention between Dr Symington and Dr Hart lay in the difference of definition. The structure and relations remain the same whether with Dr Symington we limit the term "floor" to the firm, resistant structures closing the pelvic outlet and attached to its bony and ligamentous margins, or, with Dr Hart, include in the term the viscera that are closely bound to them by their peritoneal investment. Dr Symington's paper was especially important in giving us a clearer impression of the relation of the firm part of the pelvic floor to the anterior wall of the pelvis; but as regards the vagina, the description of the behaviour of its walls in labour given by Dr Hart seemed to be correct, that the anterior wall moves mainly upwards and the posterior mainly downwards during the descent of the fœtal head. It seemed somewhat arbitrary to place the vagina partly in the pelvic floor and partly in the pelvic cavity; and if this was to be done, it would be necessary to define what portion of it was diaphragmatic and what was visceral.

Dr Halliday Croom expressed his appreciation of the papers which had been read. He was of opinion that the inference drawn from sectional anatomy from frozen cadavera or portions of cadavera had been carried beyond what the sections themselves warranted. In any case, he believed it certainly to be the case that much too general conclusions had been drawn from the examination of a limited number of specimens. Dr Symington's paper was full of interest, and so far as he (Dr Croom) could judge of an anatomical subject described for the first time, he was entirely in accord with Dr Symington. Dr Symington's pelvic floor seemed to him a definite and fixed body, with clear relations. Upon it lay the pelvic viscera—bladder, uterus, and rectum. He could not imagine a floor with such varying relations as that described by Dr Hart, containing as it did an ever filling and emptying bladder and rectum. Dr Hart had claimed that his floor was a clinical floor. That Dr Hart had described the behaviour of the



Parturient section

W. & A.K. Johnston, Edinburgh & London.

pelvic contents during labour was one thing, but to describe a definite anatomical floor was quite another. Dr Hart had attempted the one, and Dr Symington the other. The whole dispute, so far as he could see, was merely a matter of words. If Dr Hart would discard his true floor, and speak of the behaviour of pelvic contents during labour, and if Dr Symington would leave labour alone, he believed both conflicting views could be satisfactorily arranged. If it was to remain a question of pelvic floor, then he entirely agreed with Dr Symington, whose pelvic floor seemed to him to be a really solid structure, containing above it the bladder, uterus, and rectum. He could not conceive, from an anatomical point of view, a floor of such varying relations as that which Dr Hart had described.

Dr Milne Murray did not wish to discuss in any detail the very interesting papers which had been read, but desired to draw attention to a certain point in Dr Hart's criticism of Dr Symington's method of investigation. Dr Hart was of opinion that Dr Symington's method of investigation was faulty, in that Dr Symington did not make his sections in a "definite direction." But it seemed to Dr Murray that it was unfair to limit the method of investigation by any such restriction. And, further, Dr Hart claimed that the direction in which he made his sections (parallel with the axis of the brim) was the most satisfactory, because this was the line of entrance of the fœtal head. But it should be remembered that the fœtal head passes *through the pelvic floor* in a very different direction to this; and, as a matter of fact, Dr Symington's sections were much nearer the correct direction, even on Dr Hart's own showing.

Dr Barbour had been greatly impressed by Dr Symington's paper, which gave the results of much valuable original work. What had struck him most was the demonstration of the firm attachment of the anterior portion of the pelvic floor under the pelvic arch. This, however, was not incompatible with mobility of the rest of this portion. To use Dr Hart's illustration of the folding-door, this was the fixed part of the hinge on which the door turned. There was, undoubtedly, a portion of the floor which moved upwards in labour, viz., the upper part of the anterior vaginal wall, with the adjacent portion of the cervix, the cellular tissue between it and the bladder, and the utero-vesical peritoneum, which limited this part of the floor above.

Dr Symington stated, in reply to the objection of Dr Hart that his transverse sections were in no definite direction, whereas they ought to be axial coronal, or in the line of the pelvis, that the floor was not in the same place as the inlet of the pelvis, and axial coronal sections would therefore divide it obliquely. The axis of the anterior part of the floor was nearly horizontal, and he had divided it nearly at right angles. Dr Hart had further maintained that axial coronal sections were those that ought to have

been made, since during labour the floor was pressed against in that direction. Dr Milne Murray had disposed of that view by showing that, although the fœtal head entered the pelvis in the axis of the pelvic inlet, yet that it altered its direction before it reached the pelvic floor. Dr Symington admitted that he had had some difficulty with regard to the relation of the vagina to the pelvic floor; still he believed that he was right in describing its lower part as in the floor, and the upper portion above it. It was only the lower portion that could be constricted by, or that came into relation with the levatores ani. The upper part of the vagina, being above the floor, was very movable, and this facilitated the physiological changes in the position of the uterus. Dr Symington had endeavoured to investigate the anatomy of the pelvic floor independent of any clinical theories, and he felt bound to differ from Dr Hart's description of the anatomical connexions of the pubic and sacral segments. He had shown that the pubic segment lying below the bladder was firmly attached to the pubes, and Dr Hart had not attempted to prove his statement that the sacral segment had a firm dove-tailed attachment to the sacrum and coccyx.

Dr Berry Hart considered Dr Symington's paper a most valuable one. His demonstration of the relation of the vagina to the vulva and of the condition of the anus was a distinct advance in anatomy. As to Dr Symington's criticisms of his own views on structural anatomy, he did not consider them valid. Dr Symington's coronal sections were not made in any definite axis, were not parallel to one another, and could therefore hit or miss important relations. In his first section Dr Symington nearly cleared the retro-pubic fat, and then cut beneath the pubic arch. This demonstrated the attachment of the pubic segment there; but Dr Hart had figured a better section already, showing how the muscles of the perineum blended and surrounded the urethra and vagina there. Dr Hart had never asserted that the pubic segment was entirely loose in its attachment. It was certainly loosely attached anteriorly, posteriorly, and laterally. All gynæcologists knew that in prolapsus uteri the displacement ceased at the pubic arch, and that the end of the urethra was fixed there. Yet Dr Symington held that this one firm attachment made the whole segment a fixed one. Then Dr Symington maintained that the sacral segment was not strongly dove-tailed into the sacrum. This, however, was not only shown in Dr Hart's mesial sections, but also in a lateral sagittal one. As to what was pelvic floor, that depended on the point of view. From a clinical point of view, the pelvic floor, canalized during labour, was bounded above by the peritoneum. Dr Symington's idea of the pelvic floor was of no use clinically in labour, and was a bad one anatomically, inasmuch as it divided the vagina, at any rate, and excluded it from the pelvic floor. Dr Symington contended that the bladder was not part of the pelvic floor, but one could not divide the pubic segment up in this way owing to the

firm attachment of urethra and vagina. There seemed to him no other explanation of the abdominal position of the bladder than the one he had first advanced, viz., that the pubic segment was drawn up in part. Not only was there a displacement upwards of the bladder, but also of the retro-pubic fat and peritoneum.

MEETING IV.—FEBRUARY 13, 1889.

Dr UNDERHILL, *President, in the Chair.*

I. *Dr G. S. Macgregor* showed for Dr Halliday Croom—(1.) A large UNILOCULAR OVARIAN TUMOUR. (2.) A DERMOID OVARIAN TUMOUR. (3.) TUBES and OVARIES removed from patient, who has suffered for 3 years from salpingo-ovaritis of gonorrhœal origin.

II. *Dr Foulis* showed his MERCURIC PELLETS.

III. FŒTAL MALARIA, AS ILLUSTRATED BY TWO CASES.

By R. W. FELKIN, M.D., F.R.S.E., Lecturer on Diseases of the Tropics and Climatology, Edinburgh School of Medicine.

IT has long been recognised as a fact that a fœtus in utero can suffer from a paroxysm of malarial fever, and ague-cake in the fœtus is perfectly familiar to those who have practised in tropical countries. To-night I am bringing forward two cases of an unusual, or, at any rate, I believe, an unrecognised character.

At an interval of some years I have met with two cases of fœtal malaria (amongst numerous examples of the ordinary kind) in which, to the best of my knowledge, the mothers were entirely free from the disease, so that the question, Can a father transmit malaria to a fœtus? has now to be considered.

The first case I saw in 1880 in South Africa, the other I met with last year in Edinburgh. Before making a few remarks on these cases, I will read my recorded notes.

In 1880 I was staying in a small place near Durban in South Africa. One night I was called up and asked if I would attend a lady staying in the same house who had been taken suddenly ill. She complained of pain and of a curious sensation in her abdomen, and said that she was over eight months pregnant. On palpating her abdomen, I distinctly felt the fœtus shaking. The lady told me that the same thing had occurred on several previous occasions, but never so severely as now, nor had she previously experienced pain. The next night, and again the next, the same thing occurred at the same hour, and the following history was given to me by the lady's husband. He had been employed for several years on

the west coast of Africa, and had suffered severely, both from intermittent and remittent fever,—so much so, indeed, that he decided to throw up his employment and to try a change of climate at the Cape after a holiday in Madeira, where he obtained a temporary situation. Whilst in that island he met his wife and married her. She was a Lancashire lady. They remained for some eight months subsequent to their marriage in Madeira, and arrived at Durban about a week before I met them. She had never suffered from malaria in any form whatever. The husband still had occasional attacks of intermittent fever, and he told me that just previous to his marriage, and for the first month after, he had had several very severe attacks. On the fourth night I was again summoned to my patient, and found that the child was again shaking violently. At the same time I ascertained that labour had commenced. On examination I found that the os was as large as a five-shilling piece, the head was presenting, and all apparently going on well. Until the head arrived on the perineum the labour was satisfactory, but from this time, although the pains had been fairly strong, no progress was made. After waiting some time, as the patient was getting exhausted, I put on forceps and delivered the head with more difficulty than I had expected, and I had very great difficulty, indeed, in delivering the body on account of the greatly distended abdomen, caused by an enlarged spleen. In spite of all my care, the perineum was slightly torn during its delivery. The further progress of this case is of little interest. All went on well, and I subsequently heard that the child was thriving, that the spleen had been reduced to about normal size, and that after birth the child had only had seven attacks of ague. I only saw one of these attacks, which was very well marked, the cold, hot, and sweating stages being all present. The paroxysm lasted about seven hours, but unfortunately I cannot find a note of the temperature. If memory serves me right, the highest temperature during the paroxysm was rather over 102° F. in the rectum.

Now, if this case had occurred alone, I do not think I should have brought it under your notice, although I consider it is a fairly conclusive one. It might, however, be objected by some that it was just possible that the mother might in some way or other have become infected by malaria, although she had manifested no symptoms. The next case, I believe, precludes all such possibility.

On the 3rd of January 1888 I was called to see Mrs H., who was suffering from pleurisy and bronchitis, and from the effects of a severe beating which she had received from her husband. She was extremely ill, and a charitable lady who took an interest in her got her a nurse. On the 5th of January the nurse told me that the woman was pregnant, and that at ten o'clock on the previous evening she had complained of pain and "fluttering" in

her abdomen. The nurse described it as being like a bad quickening, and said it lasted for about an hour. I told her to send for me should it occur again, and I was sent for the same evening at 10.30. On examining the patient I was forcibly reminded of the case above described. On January 7th, at the same time, after another similar paroxysm, labour came on, and the child was born about half an hour before I arrived. It was very feeble, about a seven-and-a-half month child, with a slightly enlarged abdomen. We managed to keep it alive for forty-eight hours, and it died on the 9th of January at 11 P.M. in the cold stage of ague, the second attack it had had since birth. The attack of ague on the 8th commenced shortly before 11 o'clock. The cold stage was very well marked, the child distinctly shivering, and continuing to do so for rather more than half an hour. The hot stage lasted about two hours, and was followed by fairly profuse perspiration, the cotton-wool in which the child was wrapped becoming quite wet. During the attack the temperature was taken several times, and the highest point reached was 102°·6.

On inquiry, I ascertained the following facts:—The child's parents had been married twelve years. The mother had never been away from Edinburgh. Three children had all been born at full time and quite healthy during the first seven years after the parents' marriage. The father then went as fireman on a steamer trading with West African ports. The men were forbidden to land at the ports, but the second engineer and this fireman managed to escape several times, and had severe remittent fever. The engineer died, and his death so frightened the fireman that he did not go on shore again, although he remained another year in the service suffering from ordinary ague. He had never suffered from syphilis. Ten months after his return home a child was born at full time, but it soon "pined away and died." Rather more than a year later another child was born. It has always been ailing, and has a rather enlarged spleen. Appropriate treatment has greatly improved this child, and now (1889) it is fairly well. Lastly, the child I have referred to was born. In all her last three pregnancies, the mother assured me that she had suffered from the curious feelings I have mentioned, and her friends had joked her about quickening so often.

With regard to this case, there is no doubt in my mind that the fœtus suffered from ague, that the mother had never had ague, and that the father had transmitted the disease to no less than three infants. Unfortunately the woman died ten days after the birth of the last child. The nurse had occasion to go out for a few hours; the woman drank a bottle or more of whisky, became exceedingly ill, and Dr Hare, who kindly saw her for me, sent her to the Infirmary, where she died soon after admission, and unfortunately no post-mortem was obtained.

Dr Woodhead has had the kindness to have sections of the liver,

spleen, and kidneys of the child cut for me. The specimens you will be able to see under the microscope.

Dr A. Bruce has been good enough to examine them for me, and to give me the following report:—

"*Kidney.*—The epithelium of the convoluted tubules shows marked cloudy swelling, the nuclei of the cells continuing to stain, while the surrounding protoplasm is highly granular, and so swollen as to occupy the whole lumen of the tubules. The nuclei of the cells of the glomeruli stain with great distinctness; the glomerular capillaries seem dilated.

"*Liver.*—The capillaries are much dilated and engorged with blood. The white corpuscles seem to contain very numerous fine granules of a dark brown and black colour. These granule-carrying leucocytes form a very distinct feature on the field; they are the first thing that attract the eye of the observer. The liver cells are somewhat cloudy.

"*Spleen.*—The spleen is congested, the venous sinuses being considerably dilated. On the field large numbers of the leucocytes in the sinuses, the endothelial cells in their walls, and the large connective tissue cells of the pulp, contain fine pigment granules identical with those observed in the liver. The Malpighian bodies appear to be fairly normal."

I think that, apart from the intrinsic interest of these cases and the comparative rarity of meeting with fœtal malaria in this country, the cases have a great importance; for they seem to me very clearly to prove that malaria is a specific disease, that it is due to a micro-organism and not to chill, as some would have us even yet believe. How could any amount of chill from which the fathers might have suffered be transmitted in the way I have indicated? And I think it is well to bring forward such cases as these, in order to keep the question as to the origin of malaria before the profession. It is not my intention to-night to enter into the general etiology of malaria, as I hope shortly to enter into it more fully in another place. All I wish to do is to introduce for discussion one point, namely, the possibility of a non-malarious woman producing a malarious child.

It is an admitted fact that the fœtus in utero may suffer from syphilis, the ovum being directly infected by the father, and the mother escaping. With regard to the transmission of syphilis from the father to the fœtus, the mother remaining unaffected, Mr Jonathan Hutchinson says:—"The evidence on this point seems to be overwhelming. It is a matter of constant experience that the father of a syphilitic infant is known to have had the disease before marriage, whilst not a symptom has ever been observed in his wife. . . . In these cases it frequently happens that the taint in the father is wholly latent, that he has for long appeared to be absolutely well, . . . it being then taken as established that the child may at the time of conception take syphilis from its father alone." But in

neither of my cases was the disease latent; it was active. Therefore I think the possibility of the father affecting the fœtus may be the more readily granted. Again, speaking of syphilis, Mr Hutchinson says:—"The transmission of the disease, as well in inheritance as in acquisition, is always effective by the conveyance from person to person, not of a tendency to disease, but of a particulate virus. The virus is probably as specific and individual as are the seeds of barley or of clover. If it passes into the sperm or germ, then the fœtus is liable to the full development of the disease; and if it chance that none of its elements do so pass, then the offspring, although born to a tainted parent, escapes free." The facts stated by Hutchinson, "that a woman who bears a syphilitic fœtus inheriting from its father, although herself remaining free from symptoms, acquires silently a state of constitution which protects her from syphilis in the future," is, I think, a proof that some day preventive inoculation will be practised against syphilis, and for malaria too, if my observations and belief be right.

Machiafava and Celli have now placed on record five cases, in which the injection of about one gram of malarial blood induced well-marked malarial fever, possessing the same type and the same symptoms in the patients inoculated as in those from whom the blood was taken, and in each case the characteristic alteration was found in the blood of the persons inoculated as well as in the blood of the patients undoubtedly suffering from malaria. It is also certain that when once a man has suffered from malaria of whatever kind, he is liable to attacks for the rest of his life. These and other facts, too numerous to mention, incline me to the belief that it is just as possible for malaria to be produced in a fœtus in utero, in the way I have indicated, as it is for other diseases, the transmission of which is now undisputed.

Professor Simpson said that he believed that the cases brought before them in Dr Felkin's paper opened up a perfectly new view of the mode of development of malaria in the fœtus in utero, and he would like to know if Dr Felkin had himself found in obstetric literature any hint of the occurrence of the mischief in infants whose mothers were free of the disease. As the cases were being read, the analogy which Dr Felkin had pointed out with the production of syphilis had occurred to him (Prof. Simpson) as it had doubtless to the other Fellows, and he thought that Dr Felkin was entirely justified in the conclusions he had drawn from his valuable record of these striking and instructive cases.

The President was greatly interested in Dr Felkin's cases and the deductions he had drawn from them. The second case seemed to prove, without any possibility of doubt, that the malarial poison, whatever its nature may be, can be transmitted direct from the father to the fœtus without infecting the mother. The first case

seemed less certainly confirming this view, because malaria may sometimes be latent. The only case of ague he had seen in connexion with pregnancy occurred in a lady who had been born in India, and had been there until she was seven years old. She then came home, and married at the age of 23. At 25 she had her first child, having never suffered either in infancy, so far as she knew, nor since she left India from any malarial disease. On the day following delivery she had a severe attack of ague, and these attacks occurred every second day for about a fortnight, and then passed off. This woman must have had the disease latent in her system from the time she left India.

Dr Felkin said, in reply to Professor Simpson, that although he could not profess to be acquainted with all the literature on the subject of malaria, he had studied it extensively, and to the best of his knowledge there was no case on record of a similar nature. He had only to-day seen in a paper by Dr L. Thomas (p. 308, *Archiv der Heilkunde*, 1866), a vague hint in relation to the point in question. Dr Thomas says, "I know not if cases are on record in which it can be proved that newly born infants are suffering from malarial cachexia where the mother had not suffered from malaria." But this is hardly to the point, as he does not refer to children suffering from malaria in utero. With reference to Dr Hart's remarks, Dr Felkin said that a very great number of children born in the tropics were born suffering from malarial cachexia, and many, too, from ague-cake. In fact, ague-cake in many cases delayed delivery and often obliged the use of forceps. Baxa in Pola said that 90 per cent. of children suckled by mothers or nurses suffering from malaria had ague, and that 30 per cent. died in the first year of life. Luck (*Rec. de Mém. de Méd. de Chir.* 1864, Nov.) relates a case in which a nurse who had suffered from malaria in Algiers returned to France, and though apparently free from malaria at the time, suckled a child whose parents were perfectly free from it, and after three months it suffered from tertian ague. And he warns against the employment of wet nurses from malarious districts. Another very interesting case could be referred to, but it is too long; it is given by Sous (*Journal de Bordeaux*, Mai, 1857). It is a rule in tropical countries to reject a wet nurse (if possible) suffering from an enlarged spleen, and it is also usual to examine her child to see that it is free from malarial cachexia or ague-cake. In India, too, it is necessary to see that the child is not a borrowed one, as wet nurses in that country are apt to be very cunning. There are also cases on record in which persons from a malarious district suffering from malaria have slept with healthy persons and have given them the disease. This last fact, however, is very doubtful, and the experience in all great epidemics seems to totally disprove the observation. It may be well to mention one or two other facts with regard to malaria. Hirsch does not believe in the contagiousness of malaria, but he admits that it may be conveyed

from place to place, basing this conclusion on Salisbury's experiment of taking earth from a malarious spot to one which was free from the disease and placing it on the window-sill of a room of a second floor in which two persons slept. The window was kept open at night. Six days after both the persons who slept in this room complained of being unwell, and on the 12th day the one, and on the 14th the other, was attacked by ague of a tertian character. And Sawyer records a case in which it is almost certain that malaria must either be contagious or that it can be conveyed in clothes or other effects. Dr L. Thomas (*Archiv der Heilkunde*, 1866) is strongly of the opinion both that malaria is contagious and that it may be given from a nurse to a healthy infant, or that an unhealthy infant can infect a nurse. In reply to the president, Dr Felkin said that he still thought that his first case was due to malaria transmitted by the father. The lady came from a non-malarious district, and the closest inquiries had failed to bring out any symptom of even masked malaria, but of course he could not be answerable for her parents or grandparents, although he obtained no history of malaria having affected the parents. The case to which the president referred was one of great interest, but it was not an uncommon thing to find that persons who had lived for many years in a malarious district were first attacked by frank ague after their return home. In these cases the poison had evidently lain dormant, or it had only previously manifested itself as masked malaria, the symptoms of which were often unrecognised by the patients. Any acute disease, however, or parturition, was quite capable of inducing in them unmistakable ague. Dr Felkin begged to thank the Society for the way in which they had received his paper.

IV. ON THE LIGHT WHICH SECTIONAL ANATOMY WILL THROW UPON THE MECHANISM OF LABOUR.

By A. H. F. Barbour, M.D., F.R.C.P.E., Lecturer on Midwifery and the Diseases of Women in the School of Medicine, Edinburgh, etc.

Labour is a process extending through successive stages, and implying various movements on the part of the body passing along the genital tract. "Mechanism of Labour" is the term applied to the movements of the whole or of parts of the child during the Second Stage as it passes through the pelvis. These movements have hitherto been studied by two methods: theoretically with a fœtal skull and dry pelvis, and clinically on the living subject; and there has been gradually evolved, as the product of an enormous amount of patient investigation, a systematized account of the movements which has been formulated in our text-books as the Mechanism of Labour. A third method of inquiry has been recently introduced—that of making frozen sections. This last is

of recent date, only of the last fifteen years; and the results are as yet scanty and to be received with caution. Hence in this short paper I intend chiefly to indicate the light which Sectional Anatomy is fitted to throw on the Mechanism of Labour, and to refer to questions which it has raised without as yet answering them.

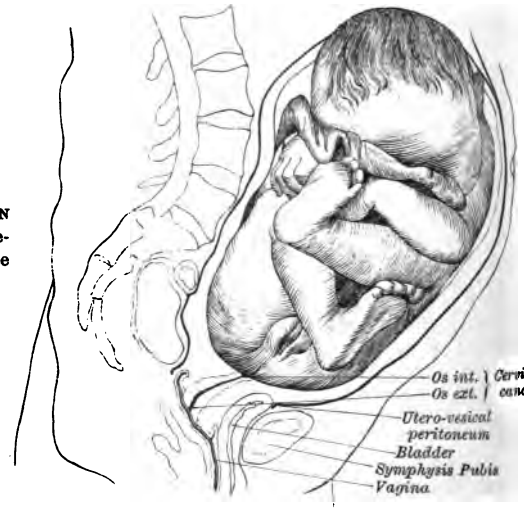
In indicating the lines along which Sectional Anatomy must advance to gain the information hitherto wanting, I would first draw attention to the point that the sections hitherto published have been mostly vertical mesial, and hence only give us the relations in the middle plane of the body. The few facts with regard to the cervical canal, the displacement of the upper portion of the bladder, and the utero-vesical peritoneum, and the extent to which the bony pelvis is encroached on in the conjugate diameters, are of great value (see Plate); but much more is wanted. To get the desired information as to the mechanism, sections must be made cutting the pelvis in those diameters and planes which are concerned in the Mechanism of Labour. Sections from above downwards in the transverse diameter and axis of the brim, and in the oblique diameters and axis of the brim, would be invaluable; and cross sections in the various planes should also be made. Veit has recently published some cross sections of the pelvis in the non-pregnant female; but to get the required data, these must also be made for cases in labour, because the distribution of the cellular tissue is different in pregnancy, and some parts will yield more than others before the child's head. Such sections, when made in that diameter in which the head is for the time lying, will show its shape, for the head will be bisected so that we can measure it: *e.g.*, the most instructive section of a case with the head lying L.O.A. would be one made through the body in the direction of the right oblique diameter of the pelvis. Such sections will further show us what the movements of the mechanism of labour actually are. To catch the movements of the head of a fœtus as it passes through the pelvis is about as difficult as to catch the movements of the limbs of a horse trotting along the road. Instantaneous photography has got over the difficulty in the latter case by catching the limbs at various points in their movements and fixing them; and by comparing a series of such photographs we can follow the movements throughout. What instantaneous photography has done for the horse trotting on the road, frozen sections will do for the child passing through the pelvis. The translator of Chiara's *Atlas* makes a happy hit in the title by his very literalness: it is a fœtus undergoing spontaneous evolution, and "*caught in the act* through corpsy congelation."

Accordingly, sections should be made in the following directions. 1. *Longitudinal sections in one of the diameters of the bony pelvis, either the transverse or the oblique.*[1]

[1] Sections in the conjugate, which has been the line always chosen hitherto, will not tell us so much unless the head be just at the vulva.

From BRAUNE'S SECTION before Labour: a head presentation—right occipito-anterior.

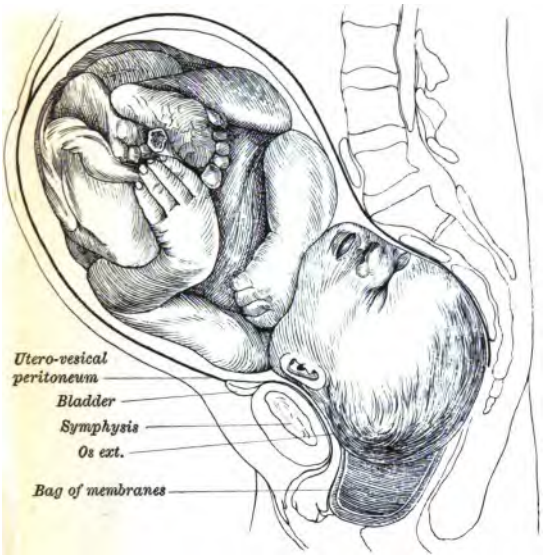
From WALDEYER'S SECTION before Labour: a breech presentation with sacrum to the left.



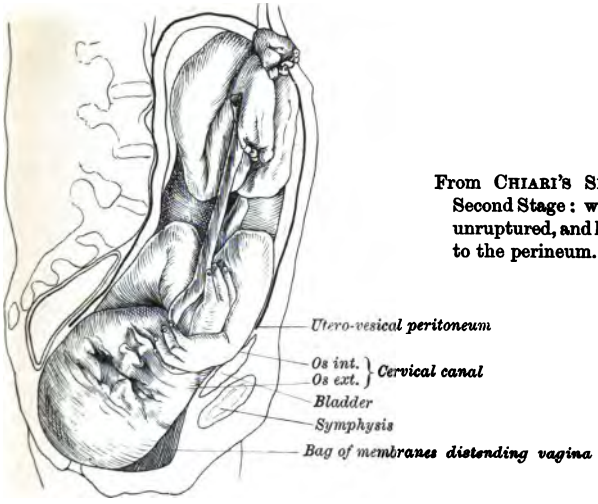
THE FŒTUS BEFORE LABOUR

Compare the length of the fœtal ovoid, the flexure of the limbs, and the attitude during the latter period by a pain.

Compare further (in Waldeyer's and Chiari's) the cervical canal, the vagina, an



From BRAUNE'S SECTION of the Second Stage (during a pain): unruptured bag of membranes at the vulva, and head in part in vagina.



From CHIARI'S SECTION of the Second Stage: with membranes unruptured, and head descended to the perineum.

DURING THE SECOND STAGE.

the head in the two periods; further, the change in long axis produced

the position of the utero-vesical peritoneum and bladder.

W. & A. K. Johnston, Edinburgh & London.

2. *Cross sections of the pelvis at right angles to the axis of the canal and in one of the recognised planes of the pelvis:* (1), in a horizontal plane passing either through the conjugate of the brim, or (2), at a slightly lower level through the transverse diameter (for we must remember that, owing to the high position of the promontory, the conjugate is above the transverse diameter); (3), in a plane passing through the lower edge of the symphysis and parallel to (1); (4), in the conjugate of the cavity; (5), in the conjugate of the outlet.

Having thus indicated the scope of Sectional Anatomy and the nature of the results to be expected from it, and given these hints as to the most profitable mode of conducting this investigation, I wish in the rest of this paper to draw attention more specifically to certain questions which these sections raise, though they have not as yet answered them:—

1. What are we to take as the starting-point in the Mechanism of Labour: at what point in the bony pelvis does the Mechanism of Labour begin?
2. How is the form of the bony pelvis modified by the soft parts?
3. What is the form of the fœtal head?
4. What are the movements of the Mechanism of Labour?

1. *Where does the Mechanism of Labour begin?*

From the text-book descriptions the student carries away the idea that the Mechanism of Labour begins at the brim of the pelvis. This idea has been gained, I believe, from our working out the mechanism theoretically with a fœtal skull in one hand and a pelvis in the other. A study of the frozen sections of the First Stage published has led me to doubt the correctness of this description, and to ask whether the Mechanism of Labour should not rather be described as beginning in the cavity. In primiparæ it is an established fact that the head is already in the pelvis, but in multiparæ we are in the habit of describing the head as being above the brim, and of making the mechanism begin there. Yet in the three frozen sections of multiparæ[1] dying in the First Stage we find the head in the pelvis. Now, in these cases, though labour has begun, the Mechanism of Labour has not yet begun—for that belongs to the Second Stage, and, as a matter of fact, we can see that it has not begun in these sections. It is to clinical experience, however, that the final appeal must be made to settle this question; and the condition present in these sections has led me to note carefully the position of the head in multiparæ at the beginning of the Second Stage. It is very difficult to locate the head in the pelvis exactly, but I have satisfied myself that it is *in the cavity;* and I should

[1] By Schroeder, Winter, and myself. In Winter's the head is in the pelvis although the placenta is prævia and compresses the placenta.

like to know whether the wider experience of the Fellows confirms this observation.

2. *How is the form of the bony pelvis modified by the soft parts?*

As already said, the three sections from the Second Stage are all vertical mesial, and therefore show us the canal only in the conjugate diameters. In Braune's we have the conjugate of the bony pelvis diminished by ·4 in. at the brim, and ·7 in. in the cavity; while in Chiari's the room taken up by soft parts is 1·4 in., the increase being due to moderate distension of the bladder and rectum. In Chiara's, again, the diminution is only ·2 in. at the brim, but ·7 in. in the cavity. The ·2 in. at the brim represents an abnormal degree of compression of the soft parts due to the pressure implied in spontaneous evolution, and perhaps because the bladder is drawn right up out of the way. The diminution in the conjugate produced by soft parts we may therefore put down provisionally as ·4 in. at the brim and ·7 in. in the cavity. We have no data for the outlet from these sections.

As regards the transverse diameters, we must turn to my own sections of the First Stage. This coronal section[1] shows very well the side walls of the pelvis with their padding of soft parts. It diminishes the space between the bones by almost an inch (·8 in.) at the brim, and rather more in the cavity (·9 in.). But this padding is composed one-half of fatty cellular tissue, which, as before mentioned, would be easily compressed by the head, and 1 in. therefore exaggerates the amount of diminution. As regards the oblique diameters, this coronal section[2] through the acetabulum shows that while at the brim ¼ in. represents the amount of shortening at its anterior end, in the cavity the muscular part of the internal oblique encroaches very distinctly on the available space—taking up ½ in., to which we must add another ¼ in. for the fatty cellular tissue and uterine wall. Finally, this section[3] which I made of the back wall of the pelvis in Hodge's first parallel plane, to ascertain the parts concerned in rotation, shows that there is no muscle here to act as an elastic pad, although the oblique diameters are shortened in the cavity posteriorly by ·3 in. on the right and ½ in. on the left—by the thickness of the uterine wall and the cellular tissue of the utero-sacral ligaments.

The different degrees of shortening, then, are: (at the brim) conjugate by ·2 in., transverse by a reducible 1 in., obliques by ·25 in. at their anterior ends; (in the cavity) conjugate by ·4 in., transverse by 1 in., obliques by ·75 in. *plus* a reducible ·5 in.

[1] Pl. vi., fig. 1, of my *Atlas of the Anatomy of Labour, etc.* W. & A. K. Johnston, Edinburgh.
[2] *Ibid.*, Pl. vi., fig. 2.
[3] *Ibid.*, Pl. iv., fig. 2.

3. *What is the form of the fœtal head?*

For this we have data from one section only. By a fortunate accident, one of my sections has almost bisected the head antero-posteriorly. The measurements here are:

Sub-occipito-bregmatic diameter,	. .	4¼ in.
Occipito-frontal	„ . . .	4½ in.
Occipito-mental	„ . . .	5 in.

These figures include the soft parts covering the skull, and are of the unmoulded head—before labour.

4. *The Mechanism of Labour.*

This is usually analysed into four movements: flexion, internal rotation, extension, and external rotation. The last two occur in the act of and after the birth of the head, and are therefore visible. The first two take place in the pelvis, and can be observed only with the hand. Any one who has tried, with finger on the posterior fontanelle, to follow the mechanism of labour throughout, will know how difficult it is to judge in that way of the movement of flexion. We analyse the progress of the child's head through the pelvis into movements as we may the progress of a ship through the water. The head flexes and extends as a ship pitches, it rotates as a ship rolls, it descends as a ship moves forwards; to follow the occiput in its course is as hard as to follow that of a ship's bow through the sea. Sectional Anatomy will, however, catch the head "in the act," and give us facts instead of fancies.

I have put side by side the sections from before labour and the second stage, so that we may study the fœtus especially in them (see Plate), and would draw attention to the following points:—

In Braune's section, the head has descended until its vertex has reached a point 4·2 in. below the brim, and is lying in part in the vagina. I mention this point emphatically, because some one may say the membranes have not ruptured, and therefore labour is still only in the First Stage. The portion of the head which is engaging is a plane parallel to a line joining the supra-orbital ridge and the top of the ear; and if we look at the drawing of the child removed from the body, the part which is highest (and would be lowest or "present" in labour) is a point 1½ in. above the posterior fontanelle, *i.e.*, the fontanelle would need to dip 1½ in. lower to become the lowest or presenting part of the head. Both of these facts show that flexion is only partial here.

In Chiari's, the head has descended to the perineum, the vertex being 4·9 inches below the brim. It is lying in the transverse diameter of the pelvis, with the occiput to the left side. This points to its having been probably a left occipito-anterior position (for a left occipito-posterior is extremely rare), which has descended

through the pelvis in the transverse diameter without rotation of the head. The attitude of the child in almost full-faced view shows that flexion is partial.[1]

Now, the usual attitude of the fœtus in utero is one of flexion. It grows flexed. If we compare the frozen section of the child before and during labour, we find that if any change has taken place it is rather an undoing than an increase of the normal attitude. I speak, of course, of labour in a normal pelvis, and we must wait for other sections; but those already made go to prove that *flexion belongs to the growth of the fœtus* (if a teleological argument were admissible, we might say it grows in that attitude in which it can most easily escape from its confinement) *rather than to the mechanism of labour.*

The elongation of the fœtal ovoid with the compression of the limbs, during the Second Stage, is also of interest; and the fact that, during a pain, its long axis is thrown forward into the axis of the pelvic inlet is of significance with regard to its being made to enter the pelvis with a minimum of resistance.

Dr Berry Hart thought Dr Freeland Barbour's paper very valuable. Of course one would require to read and study it carefully before giving any definite opinion, but it was evident that Dr Barbour's criticisms were justified, especially as to the movement of flexion. Dr Hart had always taught that it only meant that one more easily felt the occiput on examination.

Professor Simpson agreed with Dr Hart as to the value of the observation contained in Dr Barbour's communication, and thought the point was important which had been developed as to the attitude of the fœtus. He (Prof. Simpson) was not prepared to accept the observation as to the apparent absence of flexion as a correct explanation of the relations of the head to the pelvic canal during its descent. In the so-called head-flexion of labour the essential phenomenon was a descent of the occiput in advance of the sinciput; and whilst this might at first be due to simple nutation, it usually resulted from a rotation of the whole child, and not merely of the head, on its transverse axis; and in the second of Braune's plates it appeared to him that the occiput was lower than the sinciput, although the whole child under the lateral compression of the uterus might, on the whole, be somewhat extended.

[1] Further, while the head has descended almost to the outlet, passing through the various planes of the pelvis only semi-flexed, its occipito-frontal plane (*i.e.*, a transverse plane passing through its occipito-frontal diameter) is not parallel to, but forms an angle open to the back with the plane of the outlet of the pelvis (*i.e.*, a transverse plane passing through the conjugate of the outlet). No movement of "synclitism" (parallelizing) has taken place, *i.e.*, the head has not adjusted itself so as to make that plane which was parallel to the plane of the brim when the head entered the pelvis likewise parallel to the plane of the outlet when the head leaves the pelvis.

Dr Barbour thanked the fellows for the reception they had given to his paper. He would emphasize what he had said as to the caution with which the results of sectional anatomy must be taken; we had only a few sections as yet, too few to generalize from. Further, we could not tell what the post-mortem changes were; for example, the settling down of the uterus due to post-mortem relaxation of the tissues would make the lower segment appear lower in the pelvis than during life. The fact remained that Braune's and Chiari's sections for the second stage show the head of the child relative to its body to be if anything less flexed than it appeared in the frozen section made during pregnancy. He quite agreed with what Professor Simpson said, that the important point was the relation of the head to the canal.

V. NOTE ON SOME ANOMALOUS CASES OF SEPARATION AND EXPULSION OF THE PLACENTA BEFORE THE BIRTH OF THE CHILD.

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For some time past anomalous separations of the placenta have occupied my thoughts, but I intended to defer special investigation of these till opportunity of studying them in the living woman occurred. A recent paper by Dr Helme has induced me, however, to bring this subject before the Fellows, inasmuch as both in Dr Helme's paper and in the discussion following, the opinion was unanimously expressed that the case recorded was against my view of placental separation.

The anomalous separations I purpose bringing before you to-night are as follows:—

I. Cases where the Placenta is separated and expelled in Twin Births in an anomalous manner.

II. Cases where the normally situated Placenta is separated and expelled in a Single Birth before the Child is born.

I. Cases where the Placenta is separated and expelled in Twin Births in an anomalous manner.

In a twin labour we may have the following phenomena as regards separation of the placenta:—

1. *Both placentæ may be separated and expelled after the birth of both children.*

2. *Both placentæ may be separated and expelled before the birth of the second child.*

3. *The placenta of the first born child may be separated and expelled after the birth of the first child and before the birth of the second.*

4. *The placenta of the second child may be expelled after the birth of the first, the second being still-born.*

5. *Both children being born, the placenta of the second may be born before that of the first.*

6. *Both placentæ may be expelled before the birth of the children.*

In 1 we have the normal third stage.

In 2 and 3 the difference is due to the fact that in the former there is only one placenta, in the latter two.

In 4 and 6 we have cases analogous to prolapsus placentæ.

The two forms for discussion under head I. are 3 and 5; 4 and 6 come under head II.

3. *The placenta of the first born child may be separated and expelled after the birth of the first child, and before the birth of the second.*

Denman gives two cases of this:—

1. C. J.; twins. The placenta of the first child was expelled immediately. The feet of the second were then found in the vagina and brought down. There was not the slightest hæmorrhage. The first was born alive, the second putrid.

2. M. C.; twins. The placenta of the first was expelled before the birth of the second, *without hæmorrhage*. Both children were born alive at the full period.

We have here, therefore, a remarkable phenomenon, viz., the separation of a placenta while the uterus contains a second child and has a large uterine area. After the first child is born, the area of its placenta cannot be 4 inches by 4 inches. However the placenta separates in such, it is at an area comparatively large, and also without the aid of blood effusion. It will of course be asked, Does the view propounded by me explain such cases? To this I answer, that nothing in these cases militates against my view, my caution being dictated by the circumstance that we have not all the facts of such before us. My view, put in the most general manner, does not assert that any area is required for the separation of a placenta. All that is necessary is a disproportion between placental area and placental site. When in twin cases the first child is born alive, as happened in the second case narrated, we have the two placentæ under different conditions. That of the child unborn has its fœtal circulation intact and its maternal only partially obliterated; while, on the other hand, that of the born child has its fœtal circulation stopped entirely and its maternal circulation as in the former. It does not, therefore, respond to the increase in site following a pain, becomes separated, and then expelled. This, I believe, will be found to be the essential mechanism.

5. *Both children being born, the placenta of the second may be born before that of the first.*

An interesting case of this has been recently recorded by Dr

Helme. It is briefly as follows: The first child was born spontaneously, while the second required its bag of membranes ruptured, and had spina bifida. The cord was not pulsating when it was born, and no respirations were made.

During the third stage the uterus contracted badly and relaxed considerably. Ultimately the lower placenta was expelled, but the upper was only partially separated, and was ultimately removed manually. Dr Helme, by passing his hand in early in the third stage, found the placentæ both unseparated, even after contraction and relaxation had occurred.

Dr Helme urges—1. That the lower placenta was separated and expelled by uterine pains, *i.e.*, by diminution of area. 2. That the placenta of the still-born child had its fœtal half not a bloodless structure, as it did not aspirate the blood there. 3. That the placenta of the living child was not expelled, although he believes all the conditions I demand for such expulsion were present.

Dr Helme's facts bear evidence of accuracy, but he has built upon them a superstructure of criticism which they cannot bear. Thus, 1. The second child was dead; at any rate its cord was not pulsating, and it did not breathe. Yet Dr Helme makes the remarkable statement that its fœtal portion was not a "bloodless structure," inasmuch as it did not breathe. Dr Helme evidently thinks that the only way the fœtal portion of the placenta is rendered bloodless is by the child's aspiration. The death of the child does the same, and consequently this placenta had the conditions as to circulation my view demands.[1]

The placenta of the living child was removed manually, as its upper portion was unseparated. This means, of course, that it was adherent there.

Dr Helme, indeed, is in a dilemma about this upper placenta. The diminution of area was, according to him, sufficient to separate the lower placenta; then why not the upper one too? If Dr Helme wishes to criticise, he should certainly criticise the diminution in area theory.

The fact is that Dr Helme has made a perfectly simple case complicated. The explanation I would give is as follows:—During the relaxations following the pains, the lower placenta and lower part of the upper placenta became separated. As during the third stage relaxation was so prominent and contraction so feeble, I am indeed disappointed not to have had Dr Helme's support instead of his

[1] Dr Helme has further misunderstood my view. During the normal third stage I consider that the placenta does not follow up the expansion of its site following a pain; but I do not assert that the absence of blood in the fœtal portion is one of the factors. It is the absence of the active fœtal circulation due to the fœtal heart. Every one knows that the cord may be tied immediately after birth without materially hindering the Third Stage, and therefore Dr Helme's criticism, besides being erroneous on this point, is unnecessary.

adverse opinion. The part of the placenta not separated was the part adherent; for, whatever may be said to the contrary, a placenta separated manually is an adherent placenta, and Dr Helme knows his work too well to separate manually a non-adherent placenta. The two placentæ at a certain stage were, therefore, exactly analogous to an ordinary placenta with its lower part separated and its upper adherent. The expulsion of the lower one would not have occurred had the placenta been a single one.

II. Cases where the Placenta is separated and expelled in a Single Birth before the Child is born.

This so-called prolapsus placentæ is one of the most remarkable phenomena connected with labour. That the normally situated placenta with its membranes should be expelled entire without hæmorrhage, and before the child is born, in a full time labour, seems incredible; yet fully authenticated cases have been noted, and place the matter beyond doubt. In a recent paper, Münchmeyer gives the history of the known cases, and describes a case with valuable details occurring in the Dresden klinik. His case, so far as it bears on the present question, is briefly as follows:—The patient had a deformed pelvis (rickety and universally contracted: c.v., 3–3¼ inches). She was in labour for some time, and at 2 A.M. the fœtal heart-sounds were not heard. Five and a half hours after this the placenta and membranes presented at the vulva, and were removed intact. The child was turned, and born with great difficulty.

The question to be settled here is whether the dead child was the result or cause of the premature separation of the placenta. That neither blood effusion nor diminution of area caused the placental separation is evident. I would urge that the placental separation and expulsion in cases like Münchmeyer's are brought about as follows:—As the result of the prolonged labour the child dies; this cuts off the fœtal circulation. The intervillous circulation is also diminished by prolonged uterine retraction, and thus we have the placenta prevented from following up the expansion of its site after the pain dies off, *i.e.*, we get a disproportion between the placental site and placental area, and separation as the result. The conditions are the same as in the normal third stage, except that the intervillous circulation is less diminished. The length of the labour after the child is dead is of importance, as this means more marked uterine retraction and greater diminution of the intervillous circulation.

It will be advisable, in conclusion, to restate my views on the subject of the separation of placenta and membranes, so as to give definiteness to the discussion. I hold that the placenta does not separate as the result of diminution of area of the placental site. In order to get separation, there must be a disproportion between

placental site and placental area. In placenta prævia the expansion in area of the lower uterine segment not being participated in by placenta, gives the necessary disproportion. In the third stage the disproportion is brought about as follows:—

1. The placental site increases slightly as the pain dies off.
2. The placenta does not respond to this, as its fœtal and intervillous circulation are cut off.

I may add that no area of diminution is necessary for separation, but merely disproportion between the placental site and area.

In this way the anomalous separation can also be cleared up.

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Dr Barbour was sorry that Dr Helme was not here to reply to Dr Hart's criticism. He said distinctly in his paper that the second placenta was not adherent; he compared the feeling in passing the hand between the placenta and its wall to passing the hand through butter, a term hardly applicable to an adherent placenta. As to Dr Hart's exposition of his theory, he spoke as if it alone turned on a disproportion of placenta and its site; while the old view turned equally on this, the difference being that the latter implied that the placenta was unable to follow the diminution of its site, while Dr Hart's implied that it could not follow its expansion. Dr Barbour believed that disproportion might operate after the area of 4 in. × 4 in. had been reached; only with that amount of diminution of area the uterus came to grasp the placenta all round, and we must take into account the action of the uterine wall as a whole on the placental mass.

Dr Foulis reported to the Society a case of adherent placenta, which after an hour's waiting he caused to be separated by giving the patient subcutaneously twelve minims of Professor Simpson's solution of ergotin. This brought on very powerful contractions of the uterus, and during one of these contractions the placenta was both separated and expelled. For an hour Dr Foulis kept his hand on the uterus with the adherent placenta, and time after time he felt the uterus relax and then contract, but still there was no separation of the placenta; and although the contractions were pretty strong, not one drop of blood escaped during the whole time, showing that the placenta was still adherent. This was not a case of *retained* placenta. It was firmly adherent to the uterine wall

everywhere, and the relaxations and contractions of the uterus quite failed to separate and expel it. It was only after the ergotin solution was given subcutaneously that the uterine contractions were sufficiently strong to separate the placenta, and when it was expelled there was a great gush of perfectly fluid crimson blood, and not a particle of clot. Dr Foulis paid special attention to this point, as the absence of any clot and the escape of only liquid crimson blood immediately following the escape of the placenta showed that the placenta had just been separated by the powerful uterine contraction. In this case uterine relaxations entirely failed to separate the adherent placenta. It required a very powerful uterine contraction to separate the placenta. Dr Foulis then called the attention of the Society to the following extract from Dr Hart's recently published paper on separation of the placenta: "If the uterus be palpated during the third stage, it will be noted to harden and diminish in bulk markedly, and then to increase in bulk and become softer. *During the hardening the internal uterine surface diminishes greatly, the contraction ring barely admitting the finger, and the uterine wall thickens: during relaxation the internal uterine area increases so that the hand passed in can be even moved about freely, and the contraction ring expands so as to allow the hand to pass.* The condition of the uterine wall is not known exactly, but I believe it is thinner. Unfortunately we do not know how the relaxing muscle increases the internal uterine surface in area, but as a matter of fact it does, and this diastole is probably active." A little further on in this paper Dr Hart goes on to say: "When the uterus contracts to the amount it does after the child is born, *the placenta fills the uterine cavity, etc.*" So that Dr Hart wishes us to believe, that though the placenta "fills the uterine cavity after the child is born," yet during relaxation the internal uterine area increases so that the hand passed in can be moved about freely, and the contraction ring expands so as to allow the hand to pass." Dr Foulis ventured to say that Dr Hart was quite wrong in his physics. Did Dr Hart mean to tell us that when the vaginal surfaces were in contact and the uterine wall closely grasped the enclosed placenta, that the uterus could so relax as to produce a cavity in which the hand could be freely moved about? This was against the laws of Nature, as Nature abhorred a vacuum. Dr Hart seemed to forget that when he inserted his hand into the uterus things were altogether changed. If it was true that the uterus closely grasped the placenta and the vaginal walls were in contact after the child was born, then, Dr Foulis maintained, the uterus could not relax so as to produce the cavity into which Dr Hart's hand could go. Dr Foulis had frequently shown the Society that this relaxation of the uterine wall was nothing more or less than a swelling up of the wall of the uterus caused by distension of all the vascular channels in its substance, brought

about by the pumping action of the left ventricle of the heart after the uterine contraction was over, and that as long as neither blood nor air escaped into the uterine cavity the uterine wall did not leave go of its tight grasp of the placenta, let it swell up ever so much, but this swelling up was limited as long as blood did not escape into the uterine cavity. Dr Foulis begged Dr Hart to reconsider his theory of separation of the placenta.

Dr Berry Hart thanked the Fellows for their reception of his paper. Dr Freeland Barbour now granted that a disproportion between placental site and area was necessary for separation, and Dr Hart held that this disproportion was impossible during the uterine retraction which caused diminution of area. Dr Foulis had misunderstood his paper, as Dr Hart held that the necessary disproportion for separation was microscopic, and that what was termed "the relaxation following a pain" was physiological and unaccompanied at first by bleeding. Dr Foulis denied that the internal uterine area increased at all during the third stage, but that it did so was a fact known to most observers. Dr Foulis denied that the blood was aspirated from the fœtal portion of the placenta, but here again most observers were against him. The case Dr Foulis related was evidently one where the placenta lay blocking the lower uterine segment or vagina, damming the effused blood back. The placenta was separated and driven down, inasmuch as Dr Foulis described the uterus as flattened. Dr Foulis's theory that the internal uterine area never increased after the pain died off, and that the increase of uterine bulk was due to blood in the uterine walls, was untenable. As to the treatment based on Dr Hart's view, it was, so far as Dr Hart had tried it, perfectly satisfactory, and had given better results than Crédé's method, which Dr Hart held to be wrong and dangerous if used for the separation of the placenta.

MEETING V.—MARCH 13, 1889.

DR UNDERHILL, *President, in the Chair.*

I. *The President* showed TWIN PLACENTÆ.

II. *Dr Halliday Croom* showed—(1), A LARGE OVARIAN TUMOUR, showing a solid lump which had lain close to liver, and rendered diagnosis somewhat difficult; (2), SMALL OVARIAN TUMOUR which complicated labour; (3), CYSTIC OVARIES WITH OCCLUDED TUBES from a case where pelvic pain and consequent bad health existed for fifteen years; (4), TWO OVARIES from a case of ovaritis, long-standing, traceable in all probability to measles.

III. AN ANALYSIS OF ONE HUNDRED AND THIRTY CASES OF ABDOMINAL SECTION.

By J. Halliday Croom, M.D., F.R.C.P.E., F.R.S.E., Physician to, and Clinical Lecturer on Diseases of Women, Royal Infirmary; Physician to the Royal Maternity Hospital; and Lecturer on Midwifery and Diseases of Women, School of Medicine, Edinburgh.

I.—One Hundred and Eight Consecutive Cases of Completed Ovariotomy and Removal of Uterine Appendages.

No. of Case.	Name.	Place of Operation.	By whom Recommended.	Age.	Married or Single.	Nature of Case.	Date of Operation.	Result.
1	Mrs P.	St Luke's Home	Dr James Simpson, Bonnington	46	M.	Multilocular Ovarian tumour	15th February 1884	Recovery.
2	Mrs T.	Do.	Dr George Mackay, Edinburgh	50	M.	Do.	18th July 1884	Do.
3	E. S.	——	Dr Halliday Croom	28	S.	Simple Ovarian tumour	20th October 1884	Do.
4	Miss H.	Mansfield Place	Do.	39	S.	Do.	2nd October 1885	Do.
5	Miss A.	9 Queensferry Street	Dr Hedley, Felton, Northum.	31	S.	Multilocular Ovarian tumour	9th December 1885	Do.
6	Miss M.	Do.	Dr Halliday Croom	35	S.	Simple Ovarian tumour	6th March 1886	Do.
7	Mrs F.	Royal Infirmary	Dr Proudfoot, Kirkcaldy	35	M.	Multilocular Ovarian tumour	31st March 1886	Do.
8	I. B.	Do.	Hospital Waiting-Room	26	S.	Removal of Appendages (Salpingo-Oöphoritis)	19th May 1886	Do.
9	Miss A.	9 Queensferry Street	Dr M'Cormick, Glenluce	37	S.	Removal of Appendages (Bleeding Fibroid)	20th June 1886	Do.
10	Mrs M.	Royal Infirmary	Dr Barbour, Edinburgh	24	M.	Hæmatosalpinx	20th July 1886	Do.
11	Mrs C.	Do.	Hospital Waiting-Room	22	M.	Do.	29th July 1886	Do.
12	E. R.	Do.	Do.	25	S.	Removal of Appendages for Bleeding Uterus	29th July 1886	Do.
13	Mrs E.	Do.	Dr Kirk, Bathgate	34	M.	Removal of Appendages for Bleeding Fibroid	14th September 1886	Do.
14	Mrs P.	Do.	Dr Ellis, Durham	42	M.	Multilocular Ovarian tumour	8th October 1886	Do.
15	C. G.	Do.	Dr J. Jamieson, Edinburgh	31	S.	Semi-solid Ovarian tumour	25th October 1886	Do.
16	Miss E.	9 Queensferry Street	Dr Thom, Jun., Crieff	30	S.	Parovarian tumour	30th October 1886	Do.
17	G. A.	Royal Infirmary	Dr MacDonald, Auchtermuchty	19	S.	Semi-solid Ovarian tumour	10th November 1886	Do.
18	Mrs C.	Veitch's Hotel, George Street	Dr Cheetham, Guiseley, Leeds.	29	M.	Removal of Appendages.—Both Ovaries enlarged and cystic	13th January 1887	Do.
19	Mrs C.	Murrayfield	Dr Reid, Glasgow	30	M.	Double Ovarian tumour	26th January 1887	Do.
20	O. G.	Royal Infirmary	Mr Fleming, Spylaw Road	29	S.	Removal of Appendages (Bleeding-Fibroid)	29th January 1887	Do.
21	M. J.	Do.	Hospital Waiting-Room	31	S.	Removal of Appendages (Salpingo-Oöphoritis)	29th January 1887	Do.

22	D. W.	St Luke's Home	Dr Haig Ferguson, Edinburgh	23	S.	Removal of Appendages (soft bleeding Uterus)	11th February 1887	Do.
23	A. W.	Royal Infirmary	Hospital Waiting-Room	33	M.	Left Ovarian tumour. Right Ovary cirrhotic	12th February 1887	Do.
24	M. M.	Do.	Dr Stiell, Lochgelly	29	M.	Removal of Appendages (Gonorrhœal Inflammation)	12th February 1887	Do.
25	Mrs K.	9 Queensferry Street	Dr Duddingston Wilson, Edin.	24	M.	Removal of Appendages (Small cystic Ovaries, thickened tubes)	10th March 1887	Do.
26	M. K.	Do.	Dr Henry Laing, Bridge of Earn.	20	S.	Parovarian tumour	18th March 1887	Do.
27	C. B.	Royal Infirmary	Dr Donald, Leith	28	M.	Left Ovarian blood cyst	19th March 1887	Do.
28	Mrs F.	9 Queensferry Street	Dr M'Lean Wilson, Penrith	47	M.	Left Dermoid cyst	23rd March 1887	Do.
29	A. W.	Royal Infirmary	Dr Burn Murdoch, Edinburgh	36	M.	Removal of Appendages (Bleeding Fibroid)	4th April 1887	Do.
30	M. A. D.	Do.	Dr Munro, Arbroath	39	M.	Left Ovarian tumour. Right Ovary cystic	2nd May 1887	Do.
31	S. M.	Do.	Dr Thom, Jun., Crieff	35	M.	Multilocular Ovarian tumour	2nd May 1887	Do.
32	H. F. Y.	St Luke's Home	Dr Barnes, Carlisle	21	S.	Removal of Appendages (Intractable dysmenorrhœa)	18th May 1887	Do.
33	P. S.	Royal Infirmary	Dr Haultain, Edinburgh	24	S.	Removal of Appendages (Intractable dysmenorrhœa)	1st June 1887	Do.
34	M. P.	Do.	Dr Douglas, Cupar-Fife	30	M.	Removal of Appendages (Salpingo-Oöphoritis)	1st June 1887	Do.
35	E. M.	St Luke's Home	Dr Sym, Edinburgh	34	S.	Left Simple Ovarian tumour. Right Dermoid cyst	4th June 1887	Do.
36	M. J.	Royal Infirmary	Dr J. W. Miller, Dundee	46	M.	Right Semi-solid Ovarian tumour	11th June 1887	Do.
37	A. M.	Do.	Dr James Miller, Dundee	26	M.	Removal of Appendages (Salpingo-Oöphoritis)	26th June 1887	Do.
38	A. B.	Do.	Dr Stiell, Lochgelly	32	S.	Double Ovarian tumour	26th June 1887	Do.
39	E. O.	Do.	Hospital Waiting-Room	24	M.	Right Dermoid. Left cystic Ovary	11th July 1887	Do.
40	M. B.	Do.	Dr Nivison, Castle-Douglas	40	M.	Removal of Appendages (Cirrhotic Ovaries)	11th July 1887	Do.
41	J. J.	Do.	Dr Rumboll, Grangemouth	27	M.	Removal of Appendages (Gonorrhœal)	22nd July 1887	Do.
42	K. K.	Do.	Dr Reid, Kirkcudbright	26	M.	Parovarian Cyst	22nd July 1887	Do.
43	M. M.	St Luke's Home	Dr Haig Ferguson, Edinburgh	24	M.	Double Ovarian tumour	27th July 1887	Do.
44	A. W.	13 Rothesay Place	Dr Lyall, Leven	26	M.	Removal of Appendages (Salpingo-Oöphoritis)	18th September 1887	Do.
45	M. J.	Royal Infirmary	Dr Blair, Shotts	19	S.	Removal of Appendages (Salpingo-Oöphoritis)	29th September 1887	Do.
46	M. B.	Do.	Hospital Waiting-Room	38	M.	Hæmato-salpinx	29th September 1887	Do.
47	S. H.	Do.	Dr Ashford, Southwaite	20	S.	Ovaries size of Tangerine oranges, prolapsed below retroverted Uterus	13th October 1887	Do.
48	M. C.	Do.	Hospital Waiting-Room	27	M.	Blood cyst of Broad Ligament	13th October 1887	Do.
49	I. C.	Do.	Dr Simpson, Bonnington	36	S.	Left simple Ovarian tumour	28th October 1887	Do.
50	I. S.	Royal Infirmary	Dr Mackay, Elgin	28	S.	Removal of Appendages (Salpingo-Oöphoritis)	28th October 1887	Do.
51	A. W.	Do.	Dr Sym, Edinburgh	18	S.	Ovarian tumour	18th November 1887	Do.
52	M. B.	Do.	Dr Ellis, Bishop Auckland	60	M.	Semi-solid Ovarian tumour	2nd December 1887	Do.
53	J. K.	Do.	Dr Fotheringham, Motherwell	24	S.	Removal of Appendages (Salpingo-Oöphoritis)	12th February 1888	Do.
54	J. M.	Do.	Dr Spence, Burntisland	25	S.	Suppurating multilocular left Ovarian tumour	25th February 1888	Do.

One Hundred and Eight Consecutive Cases of Completed Ovariotomy and Removal of Uterine Appendages—(continued).

No. of Case.	Name.	Place of Operation.	By whom recommended.	Age.	Married or Single.	Nature of Case.	Date of Operation.	Result.
55	R. S.	13 Rothesay Place	Dr Hyslop, Edinburgh	26	M.	Removal of Appendages (Salpingo-Oöphoritis)	27th February 1888	Recovery.
56	E. T.	Royal Infirmary	Dr Chapman, Inverness	29	M.	Removal of Appendages (Salpingo-Oöphoritis)	17th March 1888	Do.
57	I. R.	Do.	Dr Haig Ferguson, Edinburgh	39	S.	Ovarian tumour	5th May 1888	Do.
58	C. A.	Do.	Hospital Waiting-Room	50	M.	Polycystic semi-solid Ovarian tumour; Uterus removed along with tumour; Extra-peritoneal stump	5th May 1888	Do.
59	M. S.	13 Rothesay Place	Dr James Grant, Stromness	27	M.	Semi-solid left Ovarian tumour	13th May 1888	Do.
60	F. R.	Royal Infirmary	Dr Ellis, Bishop Auckland	19	S.	Ovarian tumour	19th May 1888	Death 36 hours after operation. Fatty Heart.
61	N. M.	Do.	Dr Cruikshank, Nairn	30	S.	Removal of Appendages (Incurable dysmenorrhœa)	19th May 1888	Recovery.
62	A. M.	Do.	Hospital Waiting-Room	42	M.	Removal of Appendages (Bleeding Fibroid)	9th June 1888	Do.
63	G. L.	St Luke's Home	Dr Mackay, Falkland	30	S.	Solid right Ovarian tumour	22nd June 1888	Death, 1st July 1888. Fatty Heart
64	G. B.	Do.	Dr Strachan, Dollar	31	S.	Double Ovarian tumour	22nd June 1888	Recovery.
65	J. H.	Royal Infirmary	Dr Ronaldson, Haddington	33	M.	Left Ovarian tumour	23rd June 1888	Do.
66	C. C.	Do.	Dr Murray, Leith	34	M.	Double Ovarian tumour	6th July 1888	Do.
67	R. D.	Do.	Dr Dudgeon, Workington	35	M.	Right Hæmatosalpinx	7th July 1888	Do.
68	I. C.	Do.	Dr M'Pherson, Bonarbridge	24	S.	Cystic Ovaries	20th July 1888	Do.
69	C. A.	28 Chalmers Street	Dr Stirling, Perth	60	S.	Right semi-solid Ovarian tumour	25th July 1888	Do.
70	C. I.	Royal Infirmary	Dr Oswald, Kinross	49	M.	Semi-solid Ovarian tumour	27th July 1888	Do.
71	M. L.	Do.	Dr Grant, Broughty-Ferry	35	M.	Double Hydrosalpinx and left Ovarian cyst	27th July 1888	Do.
72	M. W.	Dundee	Dr Sinclair, Dundee	40	M.	Semi-solid left Ovarian tumour	4th August 1888	Do.
73	C. T.	Royal Infirmary	Dr Irvine, Pitlochry	70	M.	Parovarian cyst	7th August 1888	Death.
74	H. M'G.	Do.	Dr Halliday Croom, Edinburgh	43	S.	Removal of Appendages (Bleeding Fibroid)	22nd September 1888	Recovery.
75	M. G.	Do.	Dr Hay, Forgue	27	S.	Removal of Appendages (Bleeding Fibroid)	22nd September 1888	Do.
76	E. B.	Do.	Dr Brown, Edinburgh	54	M.	Right semi-solid Ovarian tumour	13th October 1888	Do.
77	I. W.	28 Chalmers Street	Dr Halliday Croom, Edinburgh	40	M.	Removal of Appendages (Bleeding Fibroid)	23rd October 1888	Do.
78	J. P.	Royal Infirmary.	Dr Macdonald, Auchtermuchty	38	S.	Removal of Appendages (Bleeding Fibroid)	24th October 1888	Do.
79	H. F.	Do.	Dr Charles Moon, Dundee.	24	M.	Double Hydrosalpinx and cirrhotic Ovaries	24th October 1888	Do.

80	E. M.	13 Rothesay Place	Dr John Playfair, Edinburgh	11	S.	Large Sarcoma of left Ovary. Right Ovary also sarcomatous	29th October 1888	Do.
81	E. C.	Royal Infirmary	Dr Charles Moon, Dundee	54	M.	Simple Ovarian tumour	6th November 1888	Do.
82	A. S.	Do.	Dr Russell, Davidson's Mains	98	M.	Left Hydro-hæmatosalpinx. Right Ovarian cyst	6th November 1888	Do.
83	E. C.	St Luke's Home	Dr Halliday Croom, Edinburgh	44	M.	Removal of Appendages for Bleeding Fibroid	8th November 1888	Do.
84	C. M.	Do.	Do.	31	S.	Removal of enlarged cystic Ovaries	8th November 1888	Do.
85	M. K.	Royal Infirmary	Do.	36	S.	Removal of Appendages for Bleeding Fibroid	16th November 1888	Do.
86	H. L.	Do.	Dr Dodds, Tranent	25	S.	Removal of Appendages (Salpingo-Oöphoritis	16th November 1888	Do.
87	J. E.	Do.	Dr Haggart, Aberfeldy	32	M.	Removal of Appendages for Bleeding Fibroid	1st December 1888	Do.
88	M. A.	Do.	Dr Macgillivray, Edinburgh	19	S.	Double Gonorrhœal Salpingitis	1st December 1888	Do.
89	L. M.	13 Rothesay Place	Dr George Gibson, Edinburgh	50	S.	Double Ovarian tumour	4th December 1888	Do.
90	E. H.	28 Chalmers Street	Dr Halliday Croom, Edinburgh	42	M.	Removal of Appendages for Bleeding Fibroid	7th December 1888	Do.
91	F. B.	13 Rothesay Place	Dr Jeffrey, Ayton	37	M.	Left Broad Ligament cyst. Right hæmatoma of Ovary	10th December 1888	Do.
92	M. M.	28 Chalmers Street	Dr Jamieson, Edinburgh	39	S.	Removal of Appendages for intractable pelvic pain	11th December 1888	Do.
93	M. C.	Royal Infirmary	Dr Bell, Kirkwall	59	M.	Double solid Ovarian tumour	11th December 1888	Do.
94	C. M. A.	13 Rothesay Place	Dr Halliday Croom, Edinburgh	41	M.	Double Ovarian hæmatoma	1st January 1889	Do.
95	S. M'K.	Royal Infirmary	Dr Andrew Smart, Edinburgh	33	M.	Removal of Ovaries for Bleeding Fibroid	10th January 1889	Do.
96	G. B. C.	13 Rothesay Place	Dr Watt, Ayr	29	S.	Double Ovarian tumour	15th January 1889	Do.
97	G. O.	Royal Infirmary	Dr Carlisle, Langham	40	S.	Multilocular Ovarian tumour	26th January 1889	Do.
98	M. G. B.	St Luke's Home	Dr Macfee, Auchterarder	27	S.	Left simple Ovarian cyst	29th January 1889	Do.
99	I. W.	Do.	Dr Menzies, Edinburgh	32	S.	Double Ovarian tumour. Right Broad Ligament hæmatocele	29th January 1889	Do.
100	E. E.	Royal Infirmary	Hospital Waiting-Room	24	M.	Removal of Appendages (Salpingo-Oöphoritis)	13th February 1889	Do.
101	M. L.	Do.	Dr Stewart, Leith	31	M.	Dermoid of left Ovary. Right Ovary removed	13th February 1889	Death — Ulcer of Stomach.
102	E. P.	Royal Infirmary	Dr Charles Moon, Dundee	48	M.	Left semi-solid Ovarian tumour	26th February 1889	Recovery.
103	A. R.	Do.	Dr Fraser, Berwick-on-Tweed	29	M.	Small left Ovarian tumour	26th February 1889	Do.
104	J. D.	13 Rothesay Place	Dr Campbell, Kirkcaldy	29	M.	Removal of Appendages (double Salpingo-Oöphoritis)	1st March 1889	Do.
105	M. N.	St Luke's Home	Dr Haultain, Edinburgh	35	S.	Removal of Appendages (intractable dysmenorrhœa)	1st March 1889	Do.
106	J. C.	13 Rothesay Place	Dr Sewell, Helensburgh	33	S.	Removal of Appendages (chronic pelvic peritonitis)	6th March 1889	Do.
107	C. B.	Royal Infirmary	Dr Thatcher, Edinburgh	28	M.	Removal of Appendages (double chronic salpingitis)	11th March 1889	Do.
108	J. T.	Do.	Dr Elder, Edinburgh	34	M.	Removal of Appendages (enlarged and cystic Ovaries)	11th March 1889	Do.

II.—Eleven Cases of Exploratory Incision.

109	Mrs H.	Melville Place	Dr Murray, Leith	30	M.	Fibro-cellular tumour of Omentum	20th October 1879	Recovery.
110	Mrs M.	Royal Infirmary	Sent from Queensberry Lodge	45	M.	Malignant disease of Omentum	22nd April 1886	Death three weeks after.
111	Mrs R.	Hampton Terrace	Dr Duddingston Wilson, Edinburgh	—	M.	Pelvic hæmatocele	25th December 1886	Death.

Eleven Cases of Exploratory Incision—(continued).

No. of Case.	Name.	Place of Operation.	By whom Recommended.	Age.	Married or Single.	Nature of Case.	Date of Operation.	Result.
112	A. C.	Royal Infirmary	Hospital Waiting-Room	19	S.	Tubercular peritonitis	15th January 1887	Death from perforation of bowel three weeks after.
113	M. B.	St Luke's Home	Dr Halliday Croom, Edinburgh	47	M.	Malignant disease of Omentum and Bladder	27th July 1887	Death.
114	I. A.	13 Rothesay Place	Dr James Young, Edinburgh	37	M.	Pelvic abscess	5th October 1887	Recovery.
115	E. M'I.	Do.	Dr Gowans, Broughty-Ferry	32	M.	Sarcoma involving Liver	21st December 1887	Do.
116	E. M'G.	Royal Infirmary	Dr Home Ross, Edinburgh	44	M.	Malignant Ovarian tumour	17th March 1888	Death.
117	C. F.	Do.	Dr Ronaldson, Edinburgh	22	S.	Obstruction of Bowels—tubercular peritonitis	15th April 1888	Do.
118	M. C.	Do.	Cowgate Dispensary	27	M.	Encysted hæmatocele	7th July 1888	Recovery.
119	I. G.	Do.	Dr Muir, Selkirk	70	M.	Large malignant tumour of Ovary involving the Liver	10th January 1889	Death.
			III.—One Case of Umbilical Hernia resulting from an Old Abdominal Section.					
120	Mrs A.	Polwarth Terrace	Dr John Playfair, Edinburgh	—	M.	Umbilical Hernia	16th July 1888	Recovery.
			IV.—Three Cases of Tubercular Peritonitis with Encysted Fluid.					
121	R. B.	Royal Infirmary	Dr M'Gregor, Dundee	39	M.	Encysted fluid from tubercular peritonitis	9th June 1888	Recovery.
122	Mrs L.	13 Rothesay Place	Dr Halliday Croom, Edinburgh	27	M.	Encysted fluid from tubercular peritonitis	7th October 1888	Do.
123	M. B.	Royal Infirmary	Dr Aitken, Buckhaven	27	M.	Encysted fluid from tubercular peritonitis	13th October 1888	Do.
			V.—Three Incompleted Operations.					
124	Mrs T.	Royal Infirmary	Dr Duddingston Wilson, Edinburgh	31	M.	Appendages on one side removed (Gonorrhœal inflammation)	2nd June 1886	Recovery.
125	F. A. L.	13 Rothesay Place	Dr Vassie, Kirkcaldy	31	S.	Multilocular Ovarian tumour—pelvic portion irremovable	8th September 1887	Death from shock.
126	I. C.	Royal Infirmary	Dr Gracie, Burntisland	24	M.	Appendages on one side removed	2nd October 1888	Recovery.
			VI.—Two Cases of Hysterectomy.					
127	Miss T.	St Luke's Home	Dr Milne Murray, Edinburgh	41	S.	Bleeding Fibroid	24th December 1884	Death.
128	M. C.	Royal Infirmary	Dr Sydney Rumboll, Grangemouth	38	M.	Do.	14th May 1887	Death ten days after from rupture of wound.
			VII.—Two Cases of Laparotomy for Purulent Peritonitis.					
129	H. M.	Royal Infirmary	Dr Macpherson, Bonar Bridge	32	M.	Purulent peritonitis — the result of hæmatocele	24th February 1885	Recovery.
130	E. S.	Cupar	Dr Sneddon, Cupar	26	M.	Purulent peritonitis—encysted, probably tubercular	15th December 1888	Do.

A Number of these Cases were published in a former Table.

The present table represents my abdominal work up till the present time, 130 cases.

The first group of 108 completed ovariotomies and removal of uterine appendages and tumours of various kinds does not require any special comment. Of this group there were 56 completed ovariotomies, and 52 cases of removal of the uterine appendages for various conditions. The deaths, of which there were four, all occurred in the ovariotomies proper. Two were due to fatty heart, and each occurred unexpectedly and suddenly; one was due to perforation of a gastric ulcer, and one to shock. They were, therefore, all unforeseen, and, so far as I know, unavoidable. In the cases of removal of the uterine appendages there were no deaths whatever.

With regard to the appendage work, I feel on looking over the recent as well as the remote results, that these operations are in the main entirely satisfactory. I have performed the operation for varying conditions, 52 times without a death. Of course this is but one part of the result. The larger question involved in the inquiry is, whether the permanent result is satisfactory. I need not refer again to the subject in detail, as I have already published the remote results, so far as my cases are concerned, in the *International Journal of Medical Sciences*. Briefly the results in 34 cases after the lapse of not less than a year were:—

For bleeding fibroid, 6 cases.—Four complete cures both of pain and hæmorrhage. One, no benefit at last report. One had not completed the year, so far is improving.

For bleeding uterus, where no fibroid could be detected, 2 cases. —Both complete cures.

For dysmenorrhœa, 3 cases. — Cures complete. Two have entirely ceased to menstruate; one menstruates irregularly, but without pain.

For hæmatosalpinx, 4 cases.—All cured.

For double hydrosalpinx, 1 case.—Cured.

For simple or gonorrhœal salpingo-oophoritis, 18 cases.—In 4 no record; 2, ventral hernia, but no pain; 5, cure complete; 1 up to present a failure; 5 doubtful as yet; 1 dyspareunia continues, but pelvic pain is gone.

Of the 5 doubtful cases, one was a hysterical woman whom I would not now touch. Another was an incomplete operation, one ovary being left. This case ought really not to be included. In the others the cure is retarded by some subsequent parametric inflammation.

Such is the state of the facts after not less than a year in 32 cases, and I think the results justify the operations.

I believe that report erred in allowing too short a time to elapse between the report and the operation; for example, 2 cases of hæmatosalpinx, which in the *International Journal* I stated were failures, have turned out entirely successful. There will always be difficulty in arriving at the truth about Hospital cases. It is cer-

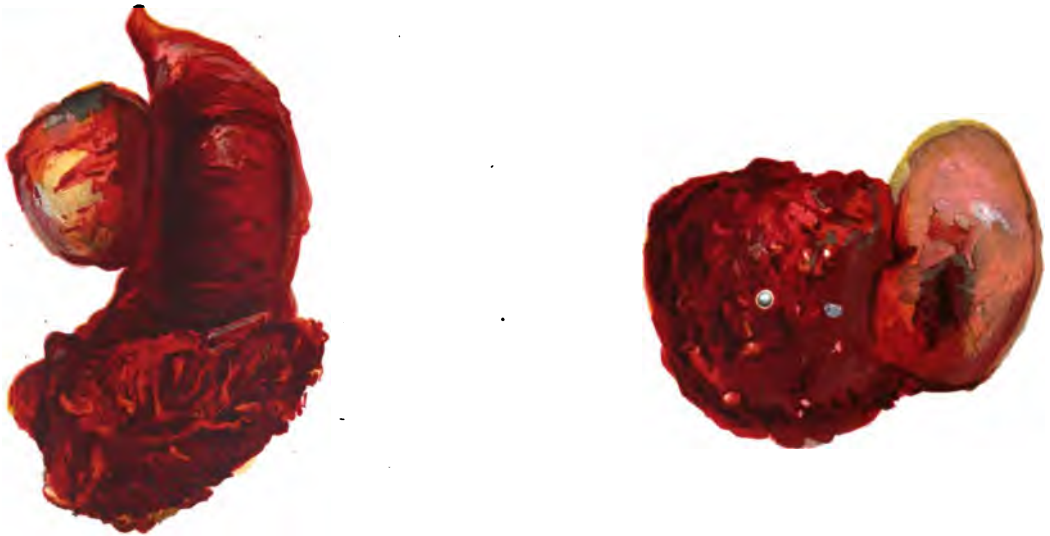
tainly a difficulty which I have experienced in giving accurate reports about patients at long intervals after they have left Hospital.

In *bleeding fibroids*, always provided they are not larger than a four months' pregnancy, I have had much satisfaction. I am well aware that there is a variety of soft myoma which is not influenced by removal of the ovaries, except rather to be stimulated to fresh growth; but so far as my knowledge goes, I have not met with any such as yet in my own practice, though I have seen a case in which the ovaries were removed, where the tumour increased in size, and in which the patient died directly from uterine hæmorrhage two years after.

I feel disposed to think that in removal of the uterine appendages, the cases where failure is met with are in hysterical women, and in them, so far as my experience goes, no matter what their alleged pain may be, removal of the appendages in no way benefits them, but only brings discredit on the operation. This is one of the many reasons which oblige me to say that the removal of the ovaries for simple dysmenorrhœa is an operation to be as a rule avoided. Certainly it is not one to be lightly undertaken. I refer, of course, to the removal of the healthy ovaries. Uncomplicated dysmenorrhœa can, as a rule, be cured or relieved by other means, but in women over thirty years of age, with long-standing dysmenorrhœa, and where menstruation exhausts and prostrates them, and makes their lives miserable, the ovaries are then generally cystic, and scarcely come under the category of normal organs. Then after other means have failed, removal can do no harm, and generally gives the desired relief.

It is a curious fact that I have only met with one case of pyosalpinx, though that condition is described as so constantly occurring in the practice of other men. I have met many cases of salpingitis, both simple and specific, where, on microscopic examination, pus corpuscles could be found more or less numerous. By pyosalpinx I mean a swollen, dilated, sacciform tube containing pus. The sketch (Plate I.) is a fair reproduction of this case. My reading and personal information lead me to the conclusion that such tumours in other places are exceedingly common. In Birmingham, London, America, there seem a very large proportion of this class of cases. I mention this fact now to ascertain whether it is merely an accident in my case, or whether my experience coincides with that of the other members of this Society. If the latter should turn out to be the case, the inference to be arrived at is clearly that specific disease is less prevalent here than elsewhere.

I should like to draw attention briefly to Case 58. She was a woman of somewhat weak intellect, suffering from a large polycystic ovarian tumour. It was everywhere adherent, and occupied me longer than I have ever been over any other case. It was impossible to separate it from the enlarged uterus, and,



GONORRHŒAL SALPINGITIS.

MURRAY DEL.

McLAGAN & CUMMING. EDIN.

BLOOD CYST OF FALLOPIAN TUBE.

therefore, I was obliged to remove the uterus entirely with the tumour, and of course leave an extra-peritoneal stump with the ordinary Koeberle clamp. Three days after the operation the patient tore off the bandage and sat over the edge of the bed, and it was only with difficulty she was prevented dragging off the clamp. She became violent, and had to be sent to the delirium tremens ward, and afterwards to an asylum. The point of interest, however, is that in the stump had been included the left ureter, and there is a leakage of urine per abdomen. How this is to be cured except by the removal of the corresponding kidney I do not know. In the meantime it affords a field for some physiological experiments.

No. 48 is a remarkable case, probably unique. The patient was sent to me with constant pelvic pain. I found a tumour per vaginam as large as a big orange, which I took to be a dilated tube. On opening the abdomen and introducing my hand into the pelvis, I found a round tumour lying on the posterior wall of the broad ligament. This came away in my hand without any trace of bleeding whatever, having seemingly scarcely any attachment at all. The ovaries were healthy on both sides, and therefore were not interfered with. This curious tumour on section turned out to be organized blood-clot, contained in muscular walls, and seems to me to have been a portion of the Fallopian tube which had been distended, and at the point of stricture had become greatly thinned, and had thus easily come off on the least manipulation. The accompanying sketch (Plate II.) gives an excellent representation of this curious tumour.

The group which seems to me to present, from a clinical point of view, features of most interest, is that of the cases of *tubercular peritonitis* with encysted fluid.

In this group there are three cases. I wish first to direct attention to those numbered 121 and 123. They were women both in the prime of life, and both enjoying, except for the abdominal swelling, perfectly good health. They were sent to the ward as cases of ovarian tumour, and such, after careful examination, I took them to be. This very point of diagnosis was most important.

In each case, for they were practically parallel, there was an abdominal swelling reaching to the umbilicus, regular, even, fluctuating. There was dulness on percussion all over, and resonance in the flanks. There was no history of any concurrent disease whatever. The temperature was normal, and the patients complained of no discomfort or suffering except the swelling.

When the patients presented themselves at the Hospital, the tumours had been in course of development from four to eight months respectively; and, so far as I am aware, were quite undistinguishable from ordinary parovarian tumours. Were such cases to present themselves to me again, I know of no way of preventing a similar error in diagnosis. Immediately the peritoneum was

reached the mistake was plain and the treatment obvious—empty the abdomen of the straw-coloured fluid, wash out with an antiseptic, and drain. I did not, in the first instance, drain in either of these. In the first case, after thoroughly removing all the peritoneal fluid and careful irrigation, there was no reaccumulation when the patient left the ward in six weeks. The second case was treated in a similar manner; in her case after her return home the fluid collected, and she had to be drained. That these were genuine cases of *tubercular hydroperitoneum*, the examination of the peritoneum as well as their after clinical history made certain. The peritoneum on being everted was thickly studded over with miliary sago-grain deposits. It is a striking fact that such advanced tubercular disease should have been found without at any time giving rise to any general symptoms or any rise of the temperature. Professor Gairdner of Glasgow in a recent lecture drew attention to cases of a somewhat similar nature occurring in children. The opening of the abdomen and evacuation of the fluid explained the anomalous physical signs. The clear percussion note on the surface, so usual in peritoneal dropsy, and its presence in both flanks, was accounted for by the fact that in an early stage of the disease the intestines had been bound down posteriorly and to the sides by plastic inflammation; the fluid developing afterwards became encysted anteriorly. The after-history of these cases is interesting. In both, a week after, the temperature began to show evening rises and morning falls with night sweats. In neither could any physical signs of tubercular disease be detected before leaving Hospital. Both patients are still, so far as I know, living, but one has developed tubercular disease in the lungs, and the other abdominal phthisis.

The third case in this group is one of *encysted peritonitis*, discovered only after the abdomen was opened. Mrs L., ten years married and sterile, had suffered all her married life constant pelvic pain, with occasional inflammatory attacks in the pelvis. She had the appearance of a woman who had gone through long suffering.

On examining per vaginam the uterus was fixed, and there was on the left side a tumour the size of an orange. This was diagnosed as a distended tube. On opening the abdomen there was well-marked indication of chronic tubercular peritonitis, and the swelling on the left side turned out to be an accumulation of encysted peritoneal fluid. The ovaries and tubes had no relation to it. The cyst was ruptured and washed out. In this case there has been no recurrence, but a distinct relief to the symptoms, and up to the present a marked improvement in health.

These cases illustrate a form of tumour which does present itself from time to time. I have searched and found a considerable number recorded in various journals, where a similar mistake was made. Others have recorded better results than mine, I mean that after evacuation the patient was entirely restored to health, no

recurrence taking place of the tubercular disease anywhere else. Taking an average, it would seem that about a fourth make entire recoveries, and the remainder pursue similar courses to mine.

The last group is certainly entirely satisfactory, I mean the cases of *suppurating peritonitis*, when the abdomen and pelvis were filled with fœtid stinking pus. Washing and draining effected a complete cure in each case.

Both my hysterectomies died. I gave details of both these cases in a former report.

With regard to Group II., it is as well to be clear as to what is meant by an exploratory incision. I mean one of two things:—Either that I opened the abdomen and found my diagnosis wrong —as, for example, in the *fibro-cellular tumour of omentum*, the case of *encysted hæmatocele*, or *the sarcoma* involving the liver—which latter, I am bound to say, I mistook for an ordinary ovarian tumour, and, of course, closed the abdomen at once; or that I opened the abdomen and found my diagnosis right, but the tumour one which did not admit of further surgical interference, mostly malignant. Of eleven such cases seven died, directly and definitely, of the disease, without any reference to the section.

Such cases are not usually placed on record in statistics, but I think it right in making a report to state every case, without making any exceptions. These cases add nothing whatever to our information as to the average mortality of any operation. I am therefore justified in excluding these cases in estimating the mortality all over my abdominal work, which would thus amount to *six per cent.*

In the management of abdominal section I consider the points essential:—*First*, Careful management of the patient beforehand, especially in the direction of baths and free purgation, as well as rest in bed for a week before; *second*, careful attention to details during the operation; *third*, free irrigation after every operation where there has been the least unusual manipulation or hæmorrhage; and *fourth*, the use of the drainage-tube.

All my operations have been performed with careful antiseptic precautions, and I have never seen any bad effect from the use of antiseptics, except in one case where there was very considerable hæmorrhage from the bowels, which I could account for in no other way than as a result of the perchloride of mercury. I have never, so far as I know, had any death attributable directly to sepsis or peritonitis. One of the most annoying minor troubles after the operation has been suppurating stitch-holes. I neither know why this occurs, nor, of course, how to prevent it.

Professor Simpson thought Dr Croom was to be heartily congratulated on the success attendant on his interesting series of laparotomies, and the observations with which he had accompanied the recital of some of his cases made his contribution one

of very great value. The cases of tubercular peritonitis were specially interesting, because experience in regard to them was only gradually accumulating. He (Professor Simpson) had met it in one case where the diagnosis had been formed that the fluid was peritoneal, and when an exploratory incision was made, with the view of ascertaining if it was associated with any removable cause, the peritoneum was found to be studded with tubercles. The cavity was cleared out, and the patient recovered well; but her history after leaving the hospital had not been traced. It was supposed that fluid would re-accumulate. With regard to the cases of ovariotomy that had been followed by death from fatty heart, he (Professor Simpson) would like to know if there had been any peritoneal inflammation found on post-mortem examination. In the only fatal ovariotomy that had occurred this last year in the Buchanan Ward the patient had fatty heart, but there was also quite distinct peritonitis. Yet the operation had been an easy one, and carried out with just such precautions as Dr Croom had described. In addition to the elements of safety enumerated by Dr Croom, he (Professor Simpson) would add rapidity of operation, so far as rapidity was consistent with due attention to the free cleansing of the peritoneal cavity. As to the rarity of pyosalpinx, his experience corresponded with that of Dr Croom.

Dr Berry Hart congratulated Dr Halliday Croom on his success. The most interesting cases were those of tubercular peritonitis, where the results of abdominal section were so gratifying. The pathology of these was exceedingly puzzling in our present state of knowledge.

Dr Brewis had great pleasure in congratulating Dr Croom on his excellent results. With regard to the remote effects in cases where the uterine appendages have been removed for disease, and to which Dr Croom alluded, Dr Brewis is of opinion that in the majority of cases they are most satisfactory. The pain disappears in most cases as soon as the patient recovers from the operation, although in some instances it is not got rid of for months. All, however, in Dr Brewis's experience are freed from it sooner or later.

Dr L. S. M'Murtry, of Kentucky, U.S.A., said,—Mr President, I listened with great interest to the valuable paper of Dr Croom, which, comprising as it does such a variety and extent of work, is an important contribution to abdominal surgery. The care and skill with which the work has been executed is attested by the admirable results achieved. In that portion of Dr Croom's paper treating of the technique of abdominal section, I was pleased to note his commendation of the drainage-tube. As my own experience increases, I am led more frequently to employ drainage. A small glass tube passed through the lower angle of the wound, properly dressed and frequently cleansed, does not appreciably

complicate the operation, and will often secure easy progress to recovery in otherwise doubtful and fatal cases. A little sentinel, it stands at the opening and tells of the progress of events within. It is a faithful index as to hæmorrhage and other intra-abdominal complications, and furnishes ready access to the parts involved. The opening quickly closes after the tube is removed. That such a series of abdominal sections should contain so few cases of pyosalpinx is very exceptional, and is doubtless due, as both Dr Croom and Professor Simpson have stated, to the comparative rarity of specific disease in Edinburgh. In the United States of America this condition is very common, and the cases present the greatest difficulties in the operation. Adhesions are extensive, the tissues involved break down under the surgeon's touch, and pour great quantities of foul pus into the peritoneum. When the diseased tissues are removed and the abdomen thoroughly cleansed and drained, the results are eminently satisfactory. The cases of encysted dropsy from tubercular peritonitis are both interesting and instructive. I do not believe it is possible in many instances to differentiate in diagnosis between encysted dropsy of the peritoneum and ovarian cyst. Indeed, the physical signs are identical. This subject at once recalls to mind the historic case reported by Sir Spencer Wells, in which he found the peritoneum teeming with miliary tubercles, and twenty-two years afterward reports the woman in good health. Dr Ely van de Walker of Syracuse, New York, has reported a similar case several years after the operation, the woman being in ruddy health. Almost two years ago I operated upon a lady past 60 years of age. She was emaciated, bed-fast, and rapidly failing. The peritoneum was studded with myriads of tubercles. She made a quick recovery, rapidly regained her flesh and strength, and now, almost two years after the operation, is in excellent health and free from any symptom of abdominal disease. In all these cases the operation has been done after a diagnosis of ovarian cystoma. Some operators have dusted over the infiltrated peritoneum with iodoform; others have applied various antiseptic solutions. It seems immaterial as to local applications, so the peritoneum be evacuated and cleansed. So far as I am aware, no explanation as to how the operation arrests the tubercular process has been made. It is a clinical fact, however, attested and confirmed by accumulating experience.

Dr Croom desired to thank the Fellows for the reception given to his paper. With regard to the remarks of Professor Simpson concerning the four deaths of the first group, Dr Croom was of opinion that there could be no doubt with regard to three of them resulting from fatty heart, although, indeed, post-mortem examination was only permitted in one. They all died suddenly, without developing any pulse or temperature. The fourth death resulted from perforation of the stomach, so far, at least, as symptoms with-

out a post-mortem examination bore this out. He was glad to know that Professor Simpson's experience coincided with his own as to the rarity of pyo-salpinx. He was not quite sure that rapidity of operation was so great a factor in successful operation as Professor Simpson claimed it to be, and certainly his experience was that death occurred more often in the easy cases than the severe ones. He believed that in many cases it was absolutely impossible to diagnose an encysted hydro-peritoneum from an ovarian tumour. Dr Hart's suggestion of drying the peritoneum and dusting it with iodoform in cases of tubercular peritonitis would probably be as successful as any other method. The whole subject was a difficult one. He was glad to hear that Dr Hart agreed with him as to the value of a drainage-tube. He thanked Dr Brewis for his remarks, and quite agreed with him in what he said with regard to the removal of the appendages in salpingo-ovaritis. To Dr M'Murtry he was obliged for his valuable criticism; and it gave him pleasure to know that his views so closely coincided with his own.

IV. *Dr Berry Hart* read his paper entitled IS THE PUBIC SEGMENT DRAWN UP DURING LABOUR? (See paper on the "Nature and Aim of Structural Anatomy," page 62.)

Dr Freeland Barbour believed that the difference between Dr Berry Hart's and Dr Symington's was largely one of definitions. There was a portion in front of the vagina that was not displaced in labour, and Dr Symington had made an important contribution to our knowledge of its anatomical relations in a recent paper; there was a portion also which moved upwards during the second stage, as Dr Hart had previously pointed out. He thought that from the obstetrical point of view it should be included in the floor; though from a purely anatomical standpoint Dr Symington might be right in excluding it.

After remarks by Dr Symington, Professor Simpson, and Dr P. A. Young, *Dr Berry Hart* said that Dr Symington's error in regard to the drawing up of the pubic segment was evident, as he had given his opinion without full consideration of all the material.

MEETING VI.—MAY 8, 1889.

DR UNDERHILL, *President, in the Chair.*

I. *Dr Brewis* showed—(1.) TWO MULTILOCULAR OVARIAN TUMOURS containing PAPILLOMATA in their interior. (2.) UTERINE APPENDAGES showing IMPERFORATE FALLOPIAN TUBES which were associated with a congenital antiflexed uterus. (3.) DISEASED UTERINE APPENDAGES, which were prolapsed, and were removed on account of the constant pain which their abnormal position produced. (4.)

SARCOMATOUS TUMOUR, probably ovarian, which was removed from a patient post-mortem. (5.) FŒTAL HEAD removed by BASILYSIS, showing the effective manner in which Professor Simpson's basilyst broke up the base.

II. *Dr Milne Murray* showed specimens of DRUGS, a NEW SPECULUM, a GALVANOMETER, and an ELECTRODE.

III. ON A VARIETY OF POST-PARTUM SHOCK: ITS NATURE, CAUSE, AND PREVENTION.

By J. HAIG FERGUSON, M.B., M.R.C.P.E., M.R.C.S., Clinical Gynæcological Tutor, Royal Infirmary; Physician to the New Town Dispensary, and late President, Royal Medical Society, Edinburgh.

IN this paper I desire to make some observations on three cases of post-partum shock which have come under my notice, one in my own practice and two which I have had the privilege of seeing with Dr Halliday Croom, to whose kindness I am indebted for the liberty of bringing them before you this evening. The cases are shortly as follows:—

CASE I.—Mrs L., aged 28, was delivered of her fourth child in the end of November 1885. The patient is of a highly nervous temperament, and her family history shows a distinctly neurotic tendency. One sister frequently developed a neurotic temperature of 108° F. A second sister had a persistent nervous cough for months, and their mother was subject to fits of catalepsy. The whole family has been under Dr Croom's personal observation for years. The previous labours were normal. The labour was an unusually short one, the child being born four hours after the commencement of pains, and the patient required neither chloroform nor forceps. The child was born half-an-hour before Dr Croom's arrival. The nurse, who was a more than usually competent woman, grasped the uterus after the birth of the child and compressed it firmly till his arrival. During that time it will be observed the uterus was firmly and forcibly compressed by a nurse thoroughly conversant with the Credé technique of delivering the placenta. The patient complained of much pain during the kneading of the uterus. The uterus contracted well, and there was no hæmorrhage. Soon after the expulsion of the placenta she suddenly became unconscious, and remained so for nearly three hours. The nurse, a most experienced person, to whom I wrote for some particulars of the case, writes as follows:—"I have seen a few people die, and I never saw any one look more like it than she. She went all through the death struggles, and had the peculiar pinched look in the face of a dying person. She then became as if she were dead, and remained so for over three hours with no pulse at all. Then gradually the pulse began to flutter, and about half-an-hour after that she was able to take a little

stimulant and then talk." Such is the nurse's graphic description of the case. The patient's symptoms appeared so urgent that her husband was called up, as Dr Croom supposed her to be in the very article of death. Her subsequent puerperal history was perfectly normal.

CASE II.—Madame de B., aged 27, was delivered of a male fœtus in December 1887. She was a healthy young primipara. The labour was perfectly normal, except that from rigidity of the external parts secondary inertia threatened to set in, and the operation of low forceps was accordingly performed by Dr Croom. After waiting a reasonable time for the delivery of the placenta, it did not seem to separate from the uterus, and Dr Croom proceeded to apply the Credé method of delivery. The patient, who was semi-anæsthetized, complained of much pain during the process. After considerable difficulty and prolonged pressure the placenta had to be extracted with the hand. There was hæmorrhage, but only slight. Immediately after the extraction of the placenta the patient became pulseless, cold, pale, and gasping. This condition was promptly combated by the injection of ether, and for some time her pulse improved and her general condition was somewhat better. In half-an-hour she was again completely collapsed, and grave fears were entertained for her life. Ether and rectal injections were again employed, and again she rallied. This sequence of events occurred at intervals during the evening. As her condition seemed to be grave at midnight, I remained in the house all night and treated her freely with stimulants. In the morning she was better, and she made an uninterrupted recovery.

CASE III.—Mrs L., aged 27, was delivered of her first child in January 1888. The patient is a healthy, well-developed woman of a somewhat nervous temperament. Her first stage lasted about eight hours, her second stage about three. The passages were roomy and moist, and dilatation proceeded satisfactorily. The head at the beginning of labour was right occipito posterior. It rotated forwards, however, of its own accord. A little chloroform was administered towards the end of the second stage, and delivery was hastened by forceps as the patient was beginning to get somewhat exhausted, and the pains were commencing to be less energetic. After the birth of the child she partially awoke from anæsthesia, and complained loudly of excessive pain when the uterus was grasped, and begged hard that it should be desisted from. The pain made her feel sick and faint, and it was intensified each time the uterus was compressed, till it became quite unbearable. Just as the placenta was expelled from the vulva the patient suddenly became unconscious. A certain amount of restlessness and uneasy moving about in bed preceded the loss of consciousness. The uterus was firmly contracted, and there was no hæmorrhage either from it or from the cervix or vestibule. The

pulse could not be felt, the breathing was almost stopped, and the patient appeared to be on the point of death. Several times, indeed, she seemed actually moribund. I was greatly alarmed by these symptoms, and as I feared that the patient was going to die in my hands, I asked Dr Croom to come and see her. This he kindly did, and he likewise shared in my anxiety. She lay in this condition for nearly three hours, and then gradually recovered consciousness.

The patients, it will be seen from the above reports, were all young, healthy women of decidedly nervous temperaments, two of them primiparæ and one a iv.-para. There was nothing specially remarkable about the first or second stage of labour in any of them, except that two were low forceps cases, and two of them had chloroform administered towards the end of the second stage. Forceps were applied to prevent exhaustion and for fear of impending inertia. None of the patients lost more than about twelve ounces of blood in the third stage, their uteri contracted firmly and well, and in no sense of the word did they suffer from post-partum hæmorrhage, concealed or otherwise. Eclampsia and cardiac disease could be clearly eliminated in all three. Yet they all manifested decided symptoms of syncope and shock, became perfectly unconscious, with feeble, rapid, irregular, sometimes imperceptible radial pulse, dilated pupils, shallow irregular breathing, and cold, clammy perspiration. The face, at first anxious, soon developed a vacant, torpid expression, and sensibility to pain absolutely and entirely disappeared.

This state of matters lasted for about three hours—fully longer in one of the cases—and there was of course complete inability to swallow. Free injection of stimulants both into the rectum and under the skin, and champagne by the mouth as soon as the power of swallowing returned, gradually, as it were, brought them back again to life. Sinapisms were freely applied to the præcordia, and it was with great difficulty that the body heat could be maintained in spite of hot-water bottles, hot blankets, and gentle massage. In from eight to twelve hours they had, to all appearance, quite recovered from the effects of the shock, and beyond a feeling of exhaustion, and some degree of tenderness in the lower part of the abdomen, nothing unusual was to be remarked. Their memory was a complete blank during the greater part of the attack.

In two of the cases the subsequent puerperal history was perfectly normal in every respect. In the third persistent sleeplessness was a source of trouble, with occasional incoherence. This ultimately developed into a mild but prolonged attack of puerperal melancholia, terminating, however, in complete recovery.

What, then, was the cause of these alarming manifestations? For alarming they most certainly were, even for a time making

one fear that life had become almost extinct. And what lesson can be gathered from these three cases, so alike in their symptoms and in their termination?

Firstly, as to the cause. It will be observed that nothing unusual occurred in the first or second stage in any of the cases, and that the patients up to the beginning of the third stage were in an entirely satisfactory condition. It is to the third stage, then, that one must look for an explanation of the phenomena.

All the patients complained of unusual tenderness when the uterus was grasped by the hand in the usual way through the abdominal wall after the expulsion of the child; and when the uterus was compressed more forcibly, according to Credé's method, in order to squeeze out the separated placenta, the pain became so intolerable as to completely awaken them from their partial anæsthesia, and they shrieked in agony, declaring it to be worse than the whole labour put together. In one of the cases the uterus was somewhat soft and flabby, and it had to be kneaded pretty energetically before it contracted satisfactorily. There was, however, no hæmorrhage to speak of. The shock in each case occurred either during or immediately after the expulsion of the placenta from the vagina, and when the uterus was being firmly grasped through the abdominal wall. There can be no doubt that the cause of the symptoms was the fact that one or both ovaries were being squeezed and bruised by the pressure of the external hand compressing one or both against the hard contracted uterus. This accounts equally for the exquisite pain from which the patients suffered when the uterus was being compressed, and for the syncope which supervened on the intense shock thus produced.

I have repeatedly seen an analogy to this occur in cases of abdominal section for the removal of the ovaries and Fallopian tubes. If, as sometimes happens (especially in cases of fibroid tumour, where the appendages are not easily brought to the surface), the ovaries should be somewhat roughly handled or accidentally torn, say by a pair of forceps, before the ligature has been tied, it is a matter of common observation that the patient, though fully anæsthetized, in the majority of cases becomes affected by modified shock. The pupils dilate, the face becomes deathly pallid, the extremities cold, a clammy perspiration breaks out, the pulse flutters, and the respirations become shallow and irregular. These symptoms pass off when the ligature is tightened, and the organ removed. If such a condition happens when atrophied, cystic, or even cirrhotic ovaries are irritated, how much more is it likely to occur when the large, congested, tender ovaries of pregnancy are forcibly compressed against the hard post-partum uterus, and when the patient is either not under the influence of an anæsthetic or is only partially anæsthetized.

I have not been able to find any description of such a danger as this in the application of Credé's method; and as it seems to me of some importance and of very considerable clinical interest, I have ventured to bring the matter before the Society to-night. The reason such an accident does not occur more frequently is because the ovary, as a rule, slips away from beneath the grasp of the hand and so escapes injury, or at least is but slightly irritated. I cannot but think it, however, of the highest importance that the avoidance of such a risk as I have been endeavouring to describe should not be left to the off-chance of the ovary accidentally eluding the grasp of the compressing hand, but that the accoucheur should have a clear idea that if he grasp the uterus in a certain way he will, as far as it is possible to do so, avoid coming in contact with the ovaries. It is to this point I wish specially to direct attention, as no notice is taken of it in the well-known descriptions of Credé's method.

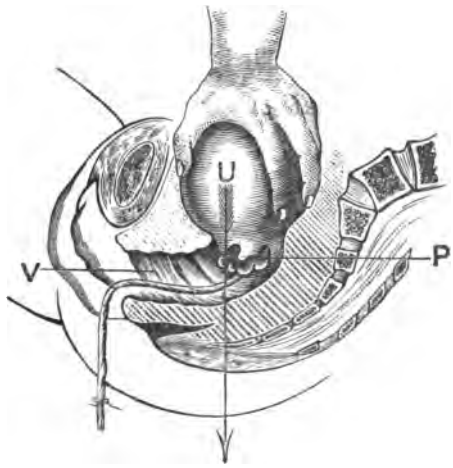


FIG. 1. Showing the position of the hand, as recommended by Credé and others, in grasping the uterus in the third stage. The fingers are in front of the sacral promontory, the thumb behind the symphysis pubis. The arrow shows the direction in which pressure is to be made (Credé).

Spiegelberg says, in describing the management of the third stage,—"The hand grasps the uterus in such a way that its ulnar side sinks deeply down behind it, the entire hollow of the hand lying on the fundus and the thumb on the anterior wall." Playfair and Lusk say exactly the same, as also does Charpentier, and Grandin of New York says that "the uterus is grasped by both hands, the fingers towards the pubes, and compression is made." Credé figures the hand grasping the uterus with the thumb behind the symphysis pubis and the fingers in front of the promontory of the sacrum (Fig. 1).

Now, from these and many similar statements it is inferred, and Grandin distinctly states in effect, that in order to grasp the

uterus antero-posteriorly the ulnar side of the compressing hand must be in relation to the promontory of the sacrum posteriorly and the thumb behind the symphysis pubis. What I wish to point out is, that if the hand is in this position the uterus is not, as a rule, grasped antero-posteriorly, and that the ovaries are consequently in imminent danger. In other words, *that the term antero-posterior* quâ *the pelvis is not antero-posterior* quâ *the uterus in the majority of cases.* As is well known, the uterus in pregnancy becomes usually rotated to the right on its longitudinal axis, so that the left ovary comes to lie more anteriorly, while the right ovary lies more posteriorly. In other words, the transverse axis of the uterus lies diagonally in the pelvis in the right oblique diameter. This has been conclusively proved from post-mortem examination, and I have had an opportunity of verifying this observation on two occasions. If, as is more than probably the case, this rotation of the uterus to the right accounts in great measure for the fact that the vertex of the fœtal head, in 99 per cent. of cranial cases, lies in the right oblique diameter of the pelvis, one can form some idea of the frequency of this condition. Barbour, in his "Anatomy of Labour," has observed one case in the first stage of labour where the right ovary was opposite the centre of the crest of the ilium, and the left ovary about an inch higher than the right, and lying just above the left posterior superior iliac spine. The transverse axis of the uterus was in this case tending to lie in the left oblique diameter of the pelvis, and the vertex of the fœtal head was likewise tending to present in the left oblique diameter. It is possible that when the uterus contracts this tendency to rotation is increased, and that it becomes more pronounced as labour advances. After the expulsion of the child this rotation still persists, so that the left ovary lies forwards and to the left, and the right ovary backwards and to the right. It is to be remembered that in pregnancy the ovaries are in close contact with the lateral walls of the uterus, owing to the shortening and splitting up of the broad ligaments.

Börner, who has investigated this subject, states that out of 64 post-partum cases which he observed, in 50 rotation was entirely absent; in 12 the rotation was to the right, and in 2 to the left. Pfannkuch has observed that when the bladder is full the rotation is increased. Dr Croom found that in 40 cases which he noted, 10 showed distinct rotation to the right. These observations were made on uteri several days post-partum, and where in all probability the contraction of the round ligaments had modified the position of the uterus, so that these statistics do not bear directly on the subject of the present paper. I am not prepared to say the proportion of cases in which rotation of the uterus is present in the third stage and immediately post-partum, but I feel sure, from clinical observation, that the proportion is a considerable one.

It will thus be seen that if the hand attempt to compress the uterus in an antero-posterior direction *quâ* the pelvis, that is, with the ulnar side of the hand in front of the promontory of the sacrum and the thumb behind the symphysis pubis, the ovaries in many cases run great risk of being included in the grasp. In the majority of cases they escape by slipping from beneath the fingers as I have stated above, or in the attempts which the hand makes to grasp the uterus the accoucheur accidentally and quite unwittingly twists the uterus round, so that its antero-posterior axis and the antero-posterior diameter of the pelvis correspond. It is just possible that the contraction of the round ligaments in some cases may produce the same effect in straightening the uterus at this time. It is often a difficult thing in the third stage of labour and immediately post-partum to tell clinically which is the anterior and which the posterior surface of the uterus, as, on account of its then having a somewhat spherical shape there are no definite

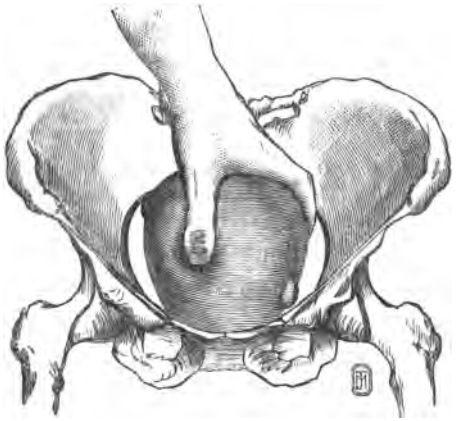


FIG. 2. Diagram to show the oblique position the uterus occupies in the pelvis after the second stage of labour. The uterus is represented as being pushed down in the pelvis by the hand, which is grasping it antero-posteriorly. Note the oblique position of the hand in relation to the pelvis. It will be seen that the right ovary lies on a higher level than the left.

landmarks to guide one, unless one can feel the contracting round ligaments, which it is not always easy to do. To avoid the danger of touching the ovaries, and to make sure of grasping the uterus antero-posteriorly, the hand should be passed into the brim of the pelvis obliquely, and as we can almost infer that in 99 per cent. of all vertex cases the uterus is rotated to the right, the ulnar side of the hand should be pressed deeply down in the direction of the left sacro-iliac synchondrosis, while the thumb should be behind the right ilio-pectineal eminence, the fundus of the uterus resting in the hollow of the palm. In the vast majority of cases such a grasp of the uterus will entirely avoid the ovaries, and firm compression can be safely made without causing the patient much pain or inconvenience (Fig. 2).

When a patient is lying on her left side in the usual obstetric position, it will be found that the operator's left hand involuntarily grasps the uterus in an *oblique direction quâ* the pelvis, and that the attempt to grasp it in an *antero-posterior direction quâ* the pelvis involves a twisted and constrained position of the hand which it would be impossible to keep up for any length of time, and would absolutely prevent the bringing into play of any degree of muscular force. Any one can prove this for himself in his daily experience. From this it will be observed that when the patient is lying on her left side, the accoucheur naturally grasps the uterus obliquely *quâ* the pelvis, and consequently, as a rule, antero-posteriorly as regards itself, so that the ovaries usually escape danger. When, however, the patient is lying on her back, this fortuitous circumstance does not come into play, and therefore there is undoubtedly more risk of the ovaries being compressed when the patient is lying in this position if the rotation of the uterus be not borne in mind.

In many cases the employment of the hand through the abdominal wall is simply a precautionary measure for the purpose of detecting and preventing relaxation of the uterus. In these circumstances no great pressure is requisite, and the ovaries are consequently not endangered.

If a patient should complain of severe pain during the manipulation of the post-partum uterus, one should always fear that the ovaries are being compressed at the same time. It is in some cases easy to feel the ovaries through the abdominal wall, and thus one is enabled to avoid them. It depends on the temperament of the patient to a great extent, as well as on the amount of bruising to which the ovaries are subjected, whether the symptoms produced by compression of the ovaries will be severe or not. True, it is not often that such alarming reflex symptoms occur as were observed in these three cases, yet there can be no doubt that the ovaries should, as far as possible, be guarded from all sources of irritation, and that every care should be taken to prevent their being injured during the third stage of labour and immediately post-partum.

If such accidents happen in the hands of those who have made a special study of the department, how much more are they likely to occur in the hands of men who Credé the uterus on no special principle, and who are only too glad to get the placenta squeezed out in any way. But it will be said no such cases have been recorded. One, however, constantly reads and hears of cases where so-called syncope has come on in the third stage or immediately thereafter. The uterus had been a little relaxed, and there had possibly been a slight threatening of hæmorrhage. The syncope is ascribed to the trifling loss of blood, often not in excess of what one would expect in a normal labour, instead of being put down, as I think in many cases it should be, to the energetic

and forcible kneading which the ovaries along with the uterus have been subjected to, in the over-zealous but well-meaning efforts of the accoucheur to avert a more or less visionary post-partum hæmorrhage; the so-called syncope being the result of shock pure and simple.

There is only one condition, so far as I know, where the post-partum uterus should, if possible, be grasped laterally through the abdominal walls, and that is in the operation for washing out its cavity. The lateral grasp is for the purpose of compressing the Fallopian tubes in order to prevent any of the fluid from passing through the tubes into the abdominal cavity. The compression in such cases requires only to be very gentle, so that there is little fear of injuring the ovaries.

Professor Simpson had not had an opportunity of seeing cases of collapse such as Dr Ferguson had described. The series of cases were of special interest, and it was an important service to obstetricians to have their attention called to the possibility of their occurrence. In all probability the explanation which Dr Ferguson had offered of the cause of the syncope was correct, and it was of the highest importance to have in view the risk of compression of the sensitive ovaries. Dr Ferguson had correctly described the position of the uterus as being oblique, and even in the unimpregnated uterus the anterior surface was directed somewhat to the right side. To avoid the risk of such compression of the ovary he (Prof. Simpson) thought that instead of directing the hand, as Dr Ferguson had suggested, with the ulnar edge of the hand to the left sacro-iliac synchondrosis and the thumb towards the right pectineal eminence, the practitioner should simply aim at grasping the uterus on its anterior and posterior aspects whatever might be its direction. The paper was an interesting and valuable one, and would do good in calling attention to an accident which was rare and worthy of further observation.

The President thanked Dr Ferguson for his interesting and suggestive paper. He had not happened to meet with such cases as Dr Ferguson described, but he thought the explanation put forward in the paper was probably the correct one. He had frequently felt what he believed to be coils of intestine slip away from under the fingers while manipulating the uterus after labour, but he was not conscious of ever having felt the ovary. He could not understand, however, why these cases of collapse were not more frequently observed if Dr Ferguson's views were correct, because the teachings of the present day laid so much stress upon the prevention of hæmorrhage after labour that every student and nurse thought it was their first duty after the child was born to seize and roughly squeeze the uterus to insure contraction, and he failed to see how it was that the ovaries so constantly escaped compression. Dr Ferguson's paper would, at all events, lead them

to observe more carefully than heretofore the exact position the uterus occupied, and to be more careful and, perhaps, less vigorous in their manipulations.

Dr Haig Ferguson thanked the Fellows of the Society most heartily for the very kind way in which they had received his paper, and for the friendly and favourable criticisms which it had evoked. He had little to add by way of reply. Professor Simpson laid stress on the importance of securing an antero-posterior grasp of the uterus, and it was with a view to this that he had ventured to bring his paper before the Society to-night, and to try to show the danger which a lateral grasp is apt to entail. It seemed to him that the risk of injuring the ovaries during the third stage of labour and immediately post-partum had been to a great extent overlooked. Dr Underhill was surprised that the ovaries are not injured more frequently, and that there are not more instances of shock in consequence. He (Dr Ferguson) thought that such accidents are commoner than is supposed. The reflex symptoms may be, and often are, comparatively slight, and are not often so grave as in the three instances he had recorded. He was convinced, however, that the cause of the symptoms is usually not recognised, and that they are erroneously attributed to something else,—often to a trifling hæmorrhage, which certainly would not account for the symptoms. He further thought that these severe reflex symptoms are more liable to occur in the upper classes than in the lower, as in them the nervous system is usually more easily affected by outside influences, and there is often a considerable degree of morbid sensitiveness to external stimuli.

IV. MITRAL STENOSIS AND LABOUR.

By D. Berry Hart, M.D., F.R.C.P.E., F.R.S.E., Lecturer on Midwifery and Diseases of Women, Surgeons' Hall, Edinburgh; Assistant Obstetric Physician, Royal Maternity and Simpson Memorial Hospital, Edinburgh; Assistant Gynæcological Physician, Royal Infirmary, Edinburgh.

Since bringing before the Society in October 1887 a communication on Mitral Stenosis and the Third Stage of Labour, I have met with three additional cases. In two of these I obtained post-mortem examinations, with results confirming my previous conclusions, and demonstrating effectively the main cause of sudden death at the end of labour.

The first patient was admitted to the Maternity in a dying condition. The history of her case, for which I am indebted to Dr Eden, one of the residents, is as follows:—

"Mrs J., age 34, was admitted to Royal Maternity Hospital on 5th January at 4 P.M., on the recommendation of Dr Simpson of Leith.

"When first seen after admission, patient was sitting propped up in bed, in the attitude of complete orthopnœa, and labouring painfully for breath. The lips were markedly cyanotic, the hands

cold, and the patient seemed restless and excited. The pulse at the wrist was rapid and feeble; respiration between 40 to 50 per minute; and so great was the dyspnœa that she could only with difficulty reply to questions put to her. She stated, however, that she was seven months pregnant with her first child, and had been married seven years. Three years ago she had rheumatic fever. Since the occurrence of pregnancy she has suffered from breathlessness, cough, swelling of feet, and increasing inability for all exertion. Latterly she had become rapidly worse.

"On examination of the heart a loud systolic murmur was heard at the aortic area, and a rough murmur was indistinctly heard in the mitral area. In the axilla the first sound was pure. The lungs presented loud crepitations everywhere, and some dulness was made out at the bases posteriorly. The abdomen showed a uterine tumour a little above the umbilicus. From the attitude of the patient the fœtal heart could not be heard.

"On vaginal examination the os was found to be undilated, and there had been no labour pains. The rectum was loaded, as also was the lower part of the colon; the bowels had not been moved for several days. The urine was very scanty, highly concentrated, and contained albumen. There was considerable œdema of feet and legs.

"An enema was given at once, and afterwards ʒss. of Henry's solution with 15 ♏ tinct. belladonnæ. Every hour, ether and strophanthus were given by the mouth.

"The patient grew quieter after an hour or two of rest, and through the following day continued in much the same condition. On the evening of 6th January she became worse, and the lungs appeared to be more choked. She was therefore dry cupped in six places over the back. This produced some relief. About midnight, however, the nurse in charge became alarmed and summoned the house physician, who found her *in articulo mortis*."

On post-mortem great œdema of the lungs with pleural and pericardial effusion was found, and the following was found to be the condition of the heart. For its examination I am indebted to the kindness of Dr Woodhead:—

"The *right auricle* was normal, and contained a large well-formed ante-mortem clot, which extended from the auricular appendage through the tricuspid valve and blocked the inferior vena-cava opening. Similarly the *right ventricle* was filled with a firm, decolorized clot, continuous with the one lying in the right auricle, as well as filling for a short distance the pulmonary artery. This clot had different degrees of consistency, and was exceptionally firm near the septum. There were only slight changes in the right ventricle, and these were confined to the muscular walls, the chamber being slightly dilated, and the muscular fibres only showing slight fatty changes.

"The *left auricle* was to a slight extent dilated and hypertrophied,

but the *left ventricle* was markedly hypertrophied, and in it, lying next the septum, was a considerable quantity of firm, decolorized clot, and small recent clots in the rest of the cavity. At the inner angle of the mitral valve were a few small recent vegetations, and one or two at the opposite angle. The outer angle of the mitral valve was much thickened, and at the point where the papillary muscle joins the chordæ tendineæ, and again where the chordæ tendineæ join the margin of the cusps, was marked thickening. The angles of the valves were quite adherent, and the auriculo-ventricular opening slightly stenosed. The cusps of the *aortic opening* were bound together at each margin with quite recent vegetations, which almost filled the lumen of the aortic opening, and gave it, on looking from above, an irregular, egg-shaped appearance. The sinuses were well defined, but the valves were thickened and calcareous. In the aorta were some small ante-mortem clots. The cavity measured 4¼ inches vertically; the thickness of the wall was ⅜–¼ inch at the extreme apex.

"*Lungs.*—The lungs were congested and œdematous, the bronchial mucous membrane congested, and the glands at the root of the lungs congested and slightly pigmented. There was also a slight pleurisy.

"*Liver.*—The morbid changes in the liver were venous congestion, fatty infiltration and degeneration, with clots in the veins.

"*Kidneys.*—In the kidney were cicatrices from old infarcts. The capsule was slightly adherent; the cortex was thin and irregular; the epithelium in the tubules was full and apparently fatty, and the Malpighian tufts large and the organ congested. The iodine reactions were negative." Microscopical examination of the mitral valve showed ulcerative endocarditis (simple) with no micro-organisms. In this case it is evident that the strain of pregnancy aggravated the heart condition, setting up fresh left-sided endocarditis, especially in the aortic segments. The aortic stenosis thus produced was of the most marked type, and as a result, we had an obstruction to the circulation causing failure of compensation, with pulmonary, pleural, and pericardial effusion. The result was exactly analogous to that of mitral stenosis, except that the resistance of the strong left ventricle had first to be overcome.

THE SECOND FATAL case has been already mentioned, regarding her second labour, in my previous paper, as "the worst case I ever had." During the puerperium of her second child she had free hæmoptysis, showing pulmonary congestion. In this, her third pregnancy, there was great œdema of the lower limbs and dyspnœa on exertion. The presystolic murmur was well marked and the heart's action irregular. Under the use of digitalis, which she had taken for several years intermittently and with great benefit, the œdema disappeared.

She fell in labour on the 2nd March, and I saw her at 9 A.M. The first stage was completed, and I delivered with forceps. In

the third stage there was a fair amount of hæmorrhage with adherent placenta, as in her last confinement. I removed the placenta manually, but immediately on the completion of the separation she turned her head slightly to the left side, became unconscious, breathed with great rapidity, and died before I had time to do anything further than give a stimulant hypodermically.

Dr Bruce performed the post-mortem. On the thorax being examined after opening the chest, it could be seen that the right auricle was greatly distended. The bloodvessels of the heart were then tied, and the heart removed so as to ascertain the condition of the cavities so far as blood distension was concerned. The right auricle, as already said, was over-distended. The heart was frozen in the vertical position, with the result that the auricular distension diminished markedly. It was therefore thawed and refrozen with its left-sided aspect lower. It was then divided by a vertical saw-cut so as to expose both sides of the heart. Blood-clot was found in the right auricle and ventricle. The left side of the heart was completely empty. The mitral valve was extremely stenosed, admitting merely the tip of the little finger.

From what I have said as to the condition of the heart, it is quite a fair account to say that—(1.) On the completion of the third stage the right auricle became over-distended and the heart paralyzed. (2.) The dyspnœa was due to absence of blood in the lung, and the unconsciousness to anæmia of the brain from emptiness of the left side of the heart. It is possible that the right side became partly engorged during the second stage.

In the THIRD CASE seen by me the patient had a marked presystolic murmur, and was pregnant for the second time. During the last six months of pregnancy she took tincture of strophanthus, 3 drops thrice daily, with no intermission. During all the time no symptoms referable to the heart appeared. She had an easy labour and recovered perfectly, except that on the second day of the puerperium there was facial paralysis, left-sided, for a few hours.

These cases seem to me to require little comment. The prognosis in such depends on two things, viz., the extent to which dilatation has advanced, and the endocarditis set up. When the failure in compensation has extended to the right side of the heart, weakening it, then the sudden strain from the excess of blood entering when the third stage is completed may prove fatal.

The extent of the dilatation of the right side may be judged of, during life, by percussion, the existence of venous pulsation and of hæmoptysis, and also, as Broadbent has more especially pointed out, by the nature of the murmur. When the first sound is not well heard, or has disappeared, this shows weakness of the left auricle; and when the murmur loses its intensity, this means, within certain limits, a weakening of the heart's action by dilatation of the left auricle and right side of the heart that bodes ill for labour.

Plate I. shows heart of fatal case of mitral stenosis cut, when frozen, so as to expose cavities.

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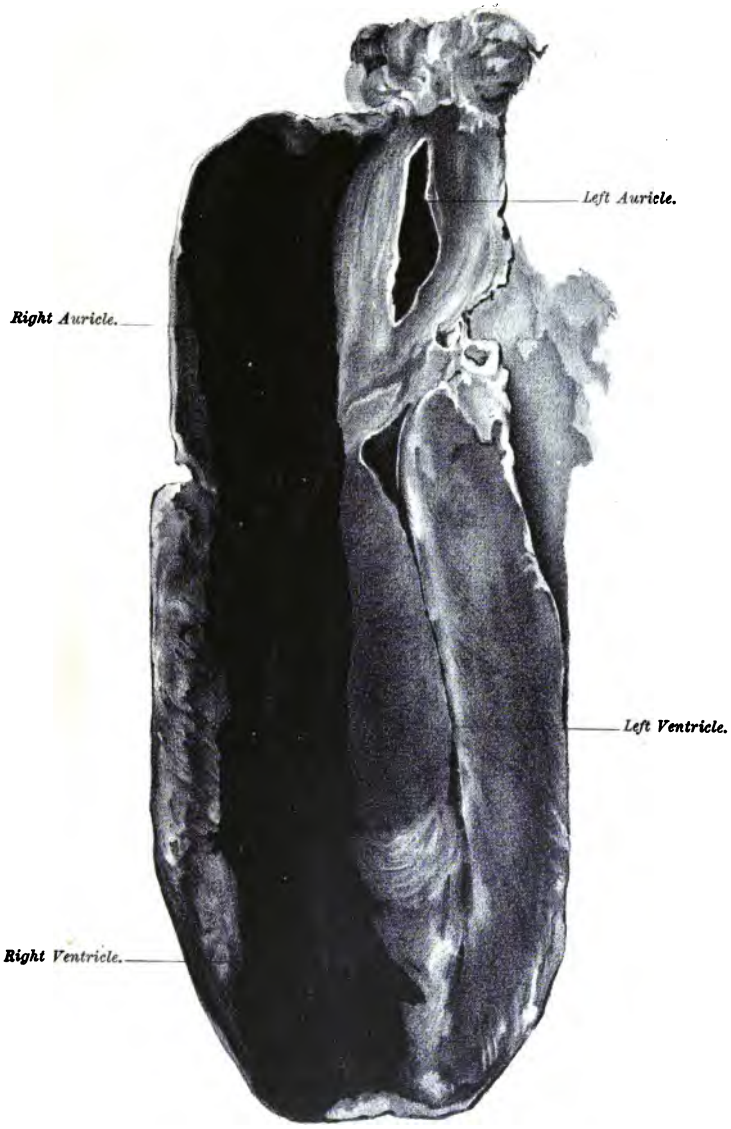
Professor Simpson thought the Society indebted to Dr Hart for the record of the cases which he had just read. It was important to get the results of the post-mortem examination in all the patients who died in pregnancy or the puerperium with various forms of heart disease, especially when, as in Dr Hart's first case, there had been observation made as to the physical condition during life. He (Professor Simpson) had seen that patient in the Maternity, where from the moment of entrance her case was hopeless from the morbid conditions of lungs and kidneys which complicated the heart affection, so that it was not one from which we could draw conclusions as to the influence of cardiac disease pure and simple.

Dr Haig Ferguson had had an opportunity of seeing one case bearing on Dr Hart's interesting paper. The patient was a primipara who suffered from double mitral, double aortic, and tricuspid murmurs, with extremely dilated right heart. She was admitted into the Hospital, and with treatment and rest she became much better as regards her symptoms, the dyspnœa being almost gone while she lay in bed. The patient was six months pregnant. Labour pains came on suddenly, and immediately all her symptoms became aggravated, and orthopnœa and cyanosis developed with great severity. As the pains set in more regularly the patient's condition became more and more serious. The os uteri just admitted the finger, and was fairly soft. The indication for speedy delivery was apparent. For this purpose a little chloroform was administered, and he proceeded to dilate the cervical canal with his fingers. This he accomplished in little more than half an hour. He then applied forceps, and delivered the fœtus as rapidly as possible. The placenta, unfortunately, was adherent, and required to be scraped away from the interior of the uterus. The uterus contracted well, and there was no hæmorrhage. After this the patient rallied a little, but her heart began to fail again, and she died from cardiac failure about three hours after delivery was effected. He regretted much that more hæmorrhage did not occur from the uterus, as it would have relieved the over-distended right side of the heart, and possibly would have allowed the circulation to have become re-established. If he should ever again meet with a similar case he should feel inclined to perform venesection, for the purpose



Section of Heart with Mitral Stenosis in case of Sudden Death at end of Labour.

W. & A.K. Johnston, Edinburgh & London.

of relieving the strain on the right side of the heart. Unfortunately, there was no post-mortem examination, so that the actual condition of the heart could not be ascertained.

The President was much interested in Dr Hart's cases; they brought to his mind the great papers on heart disease in connexion with labour which were read before the Society by the late Dr Angus Macdonald. He thought that, had the first case been in a position to have received careful treatment during the earlier part of her pregnancy, the result might have been different. He did not quite follow Dr Hart's explanation of the sequence of events in the third case, nor did he quite understand how the left heart came to be empty and the right heart over-distended, as the post-mortem showed was the case. He had recently had under his care a woman with a bad mitral stenosis. During her pregnancy she had frequent attacks of dyspnœa, and was seldom able to sleep unless propped up in bed. By continued use of strophanthus throughout the pregnancy she arrived at the full time without mishap and in fair condition. The labour was tedious in its earlier stage, but as soon as the os was dilated chloroform was given and the forceps applied, and after a period of considerable dyspnœa and consequent anxiety, she rallied and made an excellent recovery.

Dr Berry Hart thanked the Fellows for their reception of his paper. In the aortic stenosis case the heart disease was primary and the pleural and pericardial effusions secondary to it. The renal affection with its old infarcts was also in all probability secondary. Dr Underhill's question was a necessary one. The right-sided dilatation was secondary; of course left-sided primary affections were the usual ones.

MEETING VII.—JUNE 12, 1889.

Dr UNDERHILL, *President, in the Chair*.

I. DOES THE INCREASE OF CIVILISATION RENDER THE OCCURRENCE OF SEPSIS MORE COMMON?

By R. W. FELKIN, M.D., etc., Lecturer on Diseases of the Tropics and Climatology, Edinburgh.

I AM prepared for a good deal of criticism upon the paper which I lay before this Society to-night, for it does not deal directly with the science of obstetrics. Also I fear that you may perhaps consider that it has too little bearing upon practical every-day work. I therefore beg your indulgence, and at the same time request your criticism. The term civilisation, as used in this paper, is intended to include both the good and evil effects which

result from the progress of races from a primitive to a cultivated state.

I must strictly limit the term "Sepsis" to its usual definition, "the probability of a patient who has undergone an operation, or of a woman who has been recently delivered, being attacked by a disease arising from putrefaction or fermentation." And I refer to those diseases which may find entrance into the body by either the subcutaneous or general connective tissue or through bone; such, for example, as septicæmia, pyæmia, puerperal fever, erysipelas, or gangrene. I must distinctly exclude all zymotic or exanthematous diseases, for with them this paper has nothing directly to do.

We are well aware that the various races of mankind at present existing differ in many ways; that, mentally and physically, marked contrasts are often observed, both racial and individual. There are also degrees in the powers of endurance, of fortitude, and of mental capacity, which are so well known as hardly to need mention, but for my purpose I must refer to some of these. Again, races differ very much in their susceptibility to certain diseases. For instance, Europeans suffer from yellow fever to a very much greater extent than do natives of the place where the fever is endemic, and the greater the distance of a man's birthplace north of the latitude infested by yellow fever, the more likely he is to be attacked by it should he enter the yellow fever zone. Of course, in this connexion, the climate of the previous residence of the individual must be taken into account, but it is evident that climate influences races. Pure-blooded Negro races and persons of the Mongolian stock do not suffer from yellow fever. To show how fatal this disease is to Europeans, the statistics of deaths per thousand which occurred in the New Orleans epidemic in 1853 showed that only 3·58 natives died per thousand, whereas 328·94 per thousand strangers from Holland succumbed. Again, malaria attacks people of the Caucasian stock far more frequently and severely than, for example, Negroes. It seems certain that there is something, be it what it may, which prevents the yellow fever or malarial poison from easily affecting individuals of certain races. It is the same with scarlet fever, which prevails to a great extent in Europe, and is hardly known in Asia or Africa. Measles, on the other hand, is far more fatal among dark races than among white, while syphilis affects whites far more seriously than blacks or Chinese. Even in the lower animal world marked differences in susceptibility to disease exist, some being perfectly safe from diseases which would kill others, a familiar fact to all who work in bacteriological laboratories, *e.g.*, anthrax will not affect some kinds of rats, nor old dogs, nor can it kill birds, although most rodents and young dogs are obnoxious to it.

Let me now refer for a few moments to wounds, to the occurrence of traumatic erysipelas and fevers following wounds, and

the prevalence of suppuration, for we shall find that in this department also remarkable differences exist.

An instance of the non-susceptibility of semi-cultivated people to erysipelas and pyæmia is mentioned by Pirogoff.[1] He there writes, "The most successful results of my surgical practice were won in the country in Podolia (South Russia). In several hundred severe operations I did not observe a single case of erysipelas or suppuration, and I only lost one of my cases, and most of the cases operated upon were without careful after-treatment. The cases were quartered in the common sitting and bedrooms together with the peasants, and the patients did not in any way belong to the peasants' families. They were mostly strangers . . . . . most of them wore for weeks together clothes soiled with blood and matter . . . . . When I remember further that if these cases had been treated in a cleanly hospital they would mostly have been followed by erysipelas or pyæmia, I can only to some extent explain my success by the fact that I operated in the country, not in one room, for all my patients dwelt separately." Now these people were only partially civilized, as they belonged to the lowest class of the Russian population.

Looking back to prehistoric times, we find it almost certainly proved that grave operations were performed by primitive men, and, according to Broca[2] and others, there is no reason to doubt that trephining was practised when the people could only use flints with which to perform the operation. This is the more easily believed, because, even at the present time, in the South Sea Islands trephining is in vogue for headache and neuralgia, and bone-scraping is employed in cases of rheumatism in old people. The Rev. Samuel Ella writes as follows:[3]—

"A notion prevails there that headache, neuralgia, vertigo, and other cerebral affections, proceed from a crack in the head or pressure of the skull on the brain. The remedy is to lay open the scalp with a cross or T-shaped incision, then scrape the cranium carefully and gently with a piece of glass until a hole is made into the skull down to the dura mater about the size of a crown-piece. Sometimes this scraping operation will be even to the pia mater by an unskilful surgeon, or from the impatience of the friends, and death is the consequence. In the best hands, about half of those who undergo the operation die from it; yet this barbarous custom, from superstition or from fashion, has been so prevalent that very few of the male adults are without this hole in the cranium, or 'have a shingle loose,' to use an Australian phrase. . . . . Formerly the trephine was simply a shark's tooth; now a piece of broken glass is found more suitable, or less objectionable, if we may even so

[1] *Grundzüge der allgemeinen Kriegschirurgie* (Leipsig, 1864).

[2] *Bul. de la Société d'Anthrop. de Paris*, 1874, p. 542; 1876, pp. 236, 431, 555, 573. *Langenbeck's Archiv*, vol. xxviii. p. 775.

[3] *Medical Times and Gazette*, vol. i. p. 50, 1874.

qualify the act. Bone-scraping is employed in cases of rheumatism in old people. The cuticle is incised longitudinally, and the centre of the ulna or tibia laid bare; then the surface of the bone is scraped with glass until a large portion of the external lamina is removed." Mr Ella goes on to say, "I never found one who had undergone the operation that said it had been efficacious in the object sought. They were still rheumatics, and some suffering great additional torture from the adhesion of the skin to the bone in the progress of cicatrization."

There can be no wonder at the fatal results in the operations on the skull above mentioned; but, with regard to the second operation, it does seem remarkable that we have no notice of any septic infection taking place, and practically we may say that in this country few surgeons would have such a large proportion of successful cases in trephining.

It is not my purpose to give very numerous descriptions of operations or practices which one would expect to be followed by septic infection. It will only be necessary to refer briefly to a sufficient number of instances to illustrate my point. Until the general practice of antiseptics was adopted, wounds of bones were greatly feared, and all the greatest surgeons, it may be said, were in favour of amputation in most cases of compound fracture of the extremities. Yet I think I may safely state that all observers agree that such wounds are not followed in uncivilized countries with the fatal results so frequently seen in Europe. At any rate, personal observation assures me that such is the case in Africa.

Looking at ovariotomy, we all know the care which is taken in performing the operation in Europe, but in Australia[1] ovariotomy is performed with rough stone knives, and, although statistics are wanting, yet we know it is often successfully performed.

In Central Africa I was much struck by the fact that the mortality following castration was very low indeed when the operation was performed upon boys under ten, although it was done in a very rough-and-ready manner, and the wounds were dressed most carelessly.

Again, the extensive practice of the removal of the clitoris and labia minora, and the sewing up of the women, which obtains so widely throughout Central Africa,[2] is very rarely followed by injurious results, although I must say I have seen cases of septicæmia following it.

It is very remarkable that African women are able to undergo the amount of surgical interference they do, for, in all cases before a child is born, the perineum is incised, and some time after delivery an operation is performed to repair the perineum, and the same procedure is undergone at each subse-

[1] Roberts—MacGillivray.

[2] *Das Weib in der Natur und Volkerkunde*, second edition, 1887.

quent delivery. It is surprising, too, to notice with what impunity abortion is brought about by mechanical means amongst uncivilized races, and in this connexion it is interesting to notice that deaths far more frequently take place from this cause in Japan, China, and India, and yet still more frequently in Turkey, than among the primitive races.

It is noteworthy that the cupping which is extensively practised among uncivilized races leads to no bad consequences. I show you a knife which was used in Central Africa for the purpose. It is exactly in the state in which it was used, and yet no inflammation or suppuration followed.

I was often interested to notice that in the Soudan the extensive sores caused by fetters or the slave-yoke were very rarely followed by septic diseases. You would hardly believe, unless you saw the extent of these wounds and the filthy condition of the unfortunate people, that it would be possible for them to escape blood-poisoning, and yet such is the fact.

I would here remark the difference noticed in Europeans and Negroes in regard to wounds, when the European is in a tropical climate.[1] I have observed again and again that Europeans suffer severely in the tropics from the slightest wound, such as a prick or a scratch, the natives being completely unaffected in general health by such trivial injuries. This may be, and undoubtedly is, due, to a great extent, to the condition of anæmia or malarial cachexia from which the Europeans are suffering at the time, but which is not, in my opinion, sufficient to cause the excessive ulceration, suppuration, or even pyæmia. The explanation of the matter, to my mind, is that the Negro can resist septic virus and the European cannot.

I must not omit to mention parturition; and if we briefly review the difficulties and dangers due to labour, we find that marked differences exist in various races. Although I personally believe that many observers have been too credulous in thinking that parturition is invariably easy amongst uncivilized tribes, yet there is good ground for many statements met with on the subject. Some of you may remember a paper I read a few years ago before this Society on "Labour in Central Africa," and I then said that easy labour was by no means of certain occurrence, but at the same time none will deny that in primitive races less difficulty is experienced and less serious after-effects follow parturition than in Europe. Puerperal fever is almost unknown. Peritonitis is extremely rare, and, although a labour may have been exceedingly severe or operative interference simply barbarous, yet in the majority of cases recovery is very rapid, and is uncomplicated by drawbacks and accidents so often experienced here.

The easy labours are doubtless accounted for by the normal

[1] *Lie Leiden des Europäers im Afrikanishen Tropenklima.* Leipzig, 1887. *Surgical Diseases of the White and Coloured Races compared.* Tiffany.

development of the skeleton and by the well-developed and healthy muscles which do so much to render labour easy, and the lessened nervous irritability plays an important part in preventing untoward symptoms; but to this nervous influence I refer elsewhere. Looking at parturition as a physiological act, it follows that the women who have not had their frames and constitutions modified and weakened by civilisation stand a far better chance than their highly cultivated, luxurious sisters. But, apart from this, I believe that difficult or easy labours are determined far more by the environment, habits, and customs of the people than by mere racial peculiarities. An active out-door life, fresh air, moderate food, early hours, the absence of corsets, etc., all tend to the advantage of the uncivilized women.

One cause of the absence of septic infection after labour in primitive races is the absence of many of the channels by which septic material in civilized countries is conveyed to the patient. Vaginal examinations during labour are rarely, if ever, practised; clothing is not so likely to carry infection; the attendants of the parturient woman do not likewise attend infectious diseases, nor do they come in contact with surgical procedure, nor make or attend post-mortem examinations; and, more than all, the patients are isolated, for we do not find lying-in hospitals in vogue among primitive peoples. I do not forget the strict seclusion in Indian zenanas, nor the insanitary condition of large Moslem cities, for these circumstances go to prove my point. The people are more civilized, and we find that sepsis is more common amongst them, but still not nearly so rife as in Europe. These last remarks must not be misunderstood. I know that in many large European hospitals antiseptics have reduced the death-rate after labour from septic causes to 1 or less than 1 per cent., but as yet this can hardly be said for the general run of cases, and, even were it so, it is only due to the advance in science compensating for the increased liability to the septic influences from which our people suffer. I take it that the liability to sepsis, which we find in an ascending scale from primitive to highly civilized people, is perhaps best illustrated by the lying-in room experiences of the various races.

In connexion with the differences which exist in liability to disease and to septic infection, I would refer to the differences observed in the amount of suffering caused by disease and injury. There is no doubt that the appreciation of pain is not the same among all peoples, and that the pain caused by a specific act, such as a cut or a stab, is not felt as acutely by some as by others. This is realized very forcibly by those who are brought into contact with Eastern or semi-civilized and barbarous races, and who find with astonishment that operations which would be considered a great ordeal in Europe are not thought much of by Negroes or Arabs.

Let me draw your attention for a moment to the enormous

amount of physical injury which the people of an Eastern race will endure for religious motives or in obedience to tribal customs. And it must be remembered that the suffering thus self-inflicted seldom causes any permanent injury. Wounds which, in their after consequences, would scarcely fail to be fatal to Europeans, or which would at least cause lingering and severe illness, heal perfectly well and rapidly, and often with little help save Nature's simple remedies.

I have frequently seen wounds heal which I expected to prove fatal, and I suppose that a like experience has been met with by all observers who have been brought into close contact with such races as I have mentioned. I will give you one or two cases which came under my own personal notice.

When in the Bahr-el-Ghazal I saw a man who had a spear driven into his back—"transfixed" was the word Gessi Pasha used when referring to him. His companions were afraid to withdraw the spear, but the Pasha, knowing that death must result if nothing were done, drew out the spear, upon which a gush of blood followed and the man fainted, when all bleeding stopped. Hot dregs of coffee, the favourite hæmostatic in that part of the world, were poured into the wound, and the chest was simply bandaged with bark cloth, a bit of banana leaf being the only dressing employed. The same day the man had to march for four or five miles, but when I saw him he was apparently quite well, although certainly the right lung, the injured one, did not expand properly, and little air entered it. Evidently considerable collapse had taken place.[1]

Some days after seeing this case I came across another remarkable instance of what a native can undergo and live through. A woman was walking along when a man tried to steal her cloth. She resisted, and he thereupon slashed her abdomen with his knife. The abdominal wall was severed from 2 inches above the umbilicus in the middle line downwards and outwards for nearly 7 inches, and the intestines protruded. The woman lost consciousness, and was found by some soldiers lying in the path. They tied a turban round her waist, and carried her a distance of three hours' journey to Gessi Pasha's headquarters, where I saw her, and she was then calm and collected. Temperature, 100°; pulse, 96. I washed the intestines and sutured the wound. She varied for a few days, but ultimately completely recovered.

I recently heard of a very similar case. When Bishop Hannington was killed near the Victoria Nyanza, most of his men were killed too. One boy, however, after receiving a gash in his side, from which his intestines protruded, was left for dead; at night the cold revived him, and he escaped after binding a banana leaf over his wound to keep his intestines in place. He reached a village where he was cared for, and he recovered and marched to the coast.

[1] *Uganda and the Egyptian Soudan.* See also paper by Dr Max Bartels in *Zeitschrift für Ethnologie*, vol. xx. 1888, p. 169.

Such horrors show what people in various parts of the world can undergo.[1] Some voluntarily submit to mutilations and ordeals, and others to barbarous customs or the results of war; yet we find that as a rule these horrible injuries are borne and recovered from with remarkable ease, and without the grave consequences which would follow in more civilized lands; at any rate, if treated in the rough and ready style in vogue in all the places I have referred to. Antiseptics are there unknown; care for the wounded is mostly carried out in a hap-hazard fashion; in many places the wounded must take care of themselves, and yet deaths from septic causes are rare, not to say unknown. We must, I think, come to the conclusion that for some reason or other these rude children of Nature are possessed of most remarkable constitutions, or else their upbringing and their surroundings must protect them from the entrance or the power of septic influences to which their, in many ways, better cared-for brethren in more civilized lands are liable. How is this? Wherein does the secret lie?

Must we not arrive at the conclusion that civilisation and culture do really increase our susceptibility to suffering; but, assuming that our physical and moral courage is not so degenerate as to account for this, we must look further for the reasons.

In the first place, we must take into account the fact that the tactile sensation of some uncivilized races, at least, is less than that of Europeans. I may here just refer to a paper I read a few weeks ago at the Pathological Club. It was an attempt to prove that the sense of feeling is less keen in Arabs and Negroes than in Europeans.

When I first operated on Arabs and Negroes, I found that both races stood pain remarkably well, and that there was less need of anæsthetics than if I had been operating on white people. The Arabs underwent operations with extreme fortitude, yet that fortitude appeared to me to be a disregard of pain induced by custom and training, and due also to peculiar mental characteristics, which one may express by the terms self-control, self-repression, or dogged endurance. With the Negroes, however, the cause seemed to be a different one. They appeared to have hardly any dread of pain, and I was determined to find a reason for this if I could. I therefore tried by a series of observations to ascertain whether the general sensibility of the Negro was equal to or less than that of the average European, and I found that the relative tactile sensibility of Europeans, Arabs, and Negroes was roughly in the proportion of 1, 2, and 3. I also discovered later that after education the acuteness of touch in Negroes was increased by one-third.

I do not, however, think that mere feeling or sensation is the only factor in the ability or non-ability of people to bear pain.

May it not be possible that, psychologically blunt as their per-

[1] Some of the examples read at the meeting are omitted to save space.

ceptions are, natives are incapable of those mental conditions and impressions which so intensify pain, and that they thus have less consciousness of bodily suffering? Differences are met with in our own country in this respect between those born and reared in towns, and those whose ancestors have lived in the country and who have themselves been brought up there. The latter are stronger in muscle and vigorous, and they have less highly strung nerves; their brains work less rapidly, but they can endure more physical work than the hothouse plants of our cities. Remember that pain has no constant value, and that the degree of pain in a case depends not only on the potency of the cause, but on the susceptibility of the sufferer. Suffering may be due to over-sensitive nerves and weak muscles. I do not mean to a weak nervous system. Herman says, "a weak nervous system is also over-sensitive, but a nervous system more sensitive than the average is not necessarily a weak one; indeed, often the reverse, for with highly intellectual powers there is often very great sensitiveness."[1]

Art has so conserved life that existence among us is in some cases rendered possible by entirely artificial means. But in native tribes the weakly die or are killed soon after birth, and so, the strong alone remaining, the race becomes hardy, a true survival of the fittest. It is only to be expected that these, whom one might poetically call "the flowers of the flock," should be able, on account of their physical strength, to resist morbific agents better than the more highly cultured Western races.

Civilisation, among other things, teaches us that man must be clothed as well as "in his right mind," whereas exposure to the fierce warfare of the elements has rendered the children of Nature hardy, as in everyday language we call them, thus popularly allowing this very truth, that they are more *hard* than we.

We are not abusing the laws of culture, but if, on the one hand, civilisation does refine and add bitterly to our suffering, we may also look to her to discover the remedy, and, by giving every help towards the advance of science and the fulfilment of natural laws, she may multiply those means of alleviation which have already diminished suffering and in some ways counteracted our capacity to feel pain.

I must now return to the main subject of my paper, the prevalence or otherwise of sepsis among different peoples.

I have alluded to the fact that native races endure wounds and operations with little, if any, mortality resulting from septic conditions, and this notwithstanding, in many cases, the insanitary surroundings of their immediate environment. How was it, then, that the insanitary condition of persons, houses, and hospitals among Europeans a few generations ago, and indeed in many places up to the present time, appear to have caused such immense

[1] *Brit. Med. Journal*, p. 1218, June 1, 1889.—G. E. Herman.

mortality after wounds and operations from the attacks of morbific microbes or sepsis?

To my thinking, it was not so much the want of sanitary arrangements that caused the mortality, although of course that played its part, as the fact that civilisation had increased nervous irritability and lowered bodily stamina amongst the European races, whereas the primitive peoples of whom we are speaking are hardy in the widest sense of the term. I do not think this argument overthrown by the fact that the ravages of sepsis have decreased among us in these days of increased civilisation, and therefore of lessened resistance, for this decrease is owing to the use of anæsthetics and the employment of antiseptic precautions. The anæsthetics remove fear, and to a great extent shock from an operation, whilst antiseptics prevent suppuration and also pain in the after-treatment of wounds.

It will probably be allowed that sepsis, under whatever guise it manifests itself, is induced either by the introduction into the body of a morbific microbe and its action within the body, or that it is due to the chemical products produced by a morbific microbe in the body it has invaded, and we must bear in mind that every natural object, animate or inanimate, has its own laws or properties of existence, according to which it invariably tends to act, and every phenomenon of Nature arises from some cause or combination of causes, which it invariably and unconditionally tends to follow.

We know from Pasteur's [1] experiments that a microbe can be rendered either more virulent or less so, and we further learn that an animal's resistance to the inroads of a microbe may vary owing to surroundings, habits, etc. So, too, I think it is with man.

It will no doubt be readily admitted that in order for a morbific microbe to do harm two things are necessary. The patient must be capable of being affected by the microbe, and the microbe must find a suitable soil in which to develop.

We have seen that not every race or every individual is liable to be affected, and it may well be that accidental circumstances alone will permit a microbe to do harm. If a healthy rabbit be inoculated with the virus of "quarter evil," for instance, it will be refractory to the disease, but if a wound or a blow be inflicted upon it, and the wounded or bruised part be inoculated, an anthrax tumour will soon appear. By the wound or blow the vitality of the rabbit is reduced, and in the bruised tissue a fitting soil is produced for the microbe's development.

It seems to me that civilisation produces in man these two very conditions:—(1.) Man in his state of wild nature has a different constitution from man living under conditions of high culture. This high culture induces nervous impressions which lower vital energy, and an artificial environment lessens corporeal resistance. Thus civilized men become more prone to the inroads of septic

[1] See "Croonian Lecture," *Brit. Med. Journal*, vol. i., 1889, p. 1269.

diseases, which can be withstood by lower races successfully. (2.) It is quite possible that the power to eliminate poisonous products is greater in uncivilized than in civilized races. At any rate it is certain that there are "individual peculiarities": (*a*) in the composition of the blood and its relation to tissue change; and (*b*) in the activity of tissue change (metabolism), coupled with free access to fresh air (complete oxygenation), which give the lower races an advantage over the higher, the latter having become through their inherited civilisation the unfortunate possessors of a fitting soil for septic infection.

Another suggestion might be thrown out, but I do not think it would hold good. It is well known that persons constantly employed in a post-mortem or dissecting room will not suffer so easily from blood-poisoning as a person newly introduced into such a place. Can it be possible, then, that uncivilized and semi-civilized races are so acclimatized and inoculated with septic material that they are as refractive to the septic poison as are the dogs M. Pasteur has rendered insusceptible to rabies?

Or again, are we to imagine that they possess an hereditary power of resistance to diseases which play such dire havoc among civilized races?

One thing is, I think, at any rate certain. We can put climatic action out of account, for in all climates—hot, temperate, and cold—there are races which are obnoxious to septic disease in every form.

I must now hasten to bring these few ideas to an end, and I shall probably do so best by giving a short summary of my paper.

I have referred to the following points:—

(1.) That races vary in different parts of the world.

a. As regards their mental and physical characteristics.

b. In their liability to suffer from various diseases.

c. In the effects which wounds exert upon them.

d. In their power of bearing pain.

(2.) That civilisation, by tending to make a race less hardy, increases sensitiveness, both to pain on the one hand, and to the inroad of morbific microbes on the other, and that therefore (3) civilisation does certainly increase the liability of a race to the power of sepsis, but that (4) fortunately science, by the strides it makes, tends to bid defiance to septic diseases, although they are rendered more potent by the advance of nations from a lower to a higher plane.

Prof. Simpson thought Dr Felkin hardly needed to make any apology for bringing before the Obstetrical Society a paper which bears in so many ways on the subjects that specially interest its members, in the course of which he had been able to throw light on distinctly obstetric matters, and in which he had embodied some

more of the important observations he had been able to make in the course of his travels in Africa. The facts he had adduced as to the power of uncivilized races to resist the effect of injuries were quite in the line of the observations that had often been made by our army surgeons in India, who found the natives recovering from injuries and surviving operations under which British soldiers almost inevitably died, and Dr Felkin's explanations had no doubt a large element of truth. He (Prof. Simpson) was afraid that Dr Felkin was inclined to lay too much stress on the difference in the nervous irritability attendant on the greater cerebral development of civilized communities, but was more satisfied when later in the paper he pointed out the condition of the tissues generally, and of the blood in particular. It would be important to have observations made on the constitution of the blood, now that the importance of the function of the white corpuscles had been recognised in the way of meeting and making away with some of the morbific elements that find their way into the system through wounds and otherwise. In the course of his interesting paper Dr Felkin had referred to the relative facility of parturition among the natives of Africa, and had rightly adduced as a cause the good muscular development of the women and healthy condition of the pelvis. But he (Prof. Simpson) thought that perhaps an even more important element was the small size of the fœtal head, associated with the less perfect development of the brain. He thought the Society and the profession were much indebted to Dr Felkin for his valuable and interesting communication.

Dr Foulis thought it would have been easier to have given an answer to this question had Dr Felkin, in the first instance, defined the term *civilisation*, as he had done the term *sepsis*. For if we went to the large towns in so-called civilized countries, as London, Paris, Berlin, etc., in each we found countless thousands of poor, wretched, half-starved creatures, full of hereditary disease, filling our numerous charitable institutions, who were quite unable to resist the deadly effects of blood-poisoning. In each city were human beings living crowded together, in bad atmospheres, badly fed, badly clothed, in ignorance, utterly disregarding the commonest sanitary laws, some of them educated in a sense, many of them very religious, very superstitious, and with a strong belief in the supernatural. There was no sympathy in *Nature*, and what could these poor creatures do in the great struggle for existence but die like flies. Such people were not civilized. They were not civilized who neglected the development of their bodies. They were not civilized who did not follow closely the unchangeable laws of Nature, but were content to live in ignorance of those laws, trusting for their happiness to the comforts of their religion, to superstition, and to a belief in the supernatural. Only the truly scientific man was civilized, and he alone had the greatest power of resisting the onslaughts of disease. He alone had the power, too, of helping his

suffering human brother. And how did he do it? Not by prayer and fasting, but by giving him a knowledge of the truth as regards the unchangeable laws of Nature. The highly civilized man was the truly scientific man, who followed, without swerving to the right or to the left, the teachings of these unchangeable laws of Nature; and who, by a knowledge of such laws, developed his mind and body to the highest degree of human excellence. And such a man, because of this development, could not be otherwise than moral, noble, and good, in the best sense. Now, if Dr Felkin would accept Dr Foulis' definition of the civilized man, the answer to the question would be as follows,—there is no comparison, and in course of time most of the septic and zymotic diseases among civilized nations will be abolished.

Dr Matheson thought the thanks of the Fellows present were due to Dr Felkin for his most interesting and instructive paper. To his mind it seemed in all probability true, from what Dr Felkin had said, that among uncivilized peoples there was a greater resisting power to septic influences. But, at the same time, it was possible another element came into play in explanation of the freedom of these races from septic diseases, namely, that the germs causing these diseases did not exist in such abundance in the surroundings as in those of civilized peoples. Dr Felkin had stated that dirt and filth were often present about wounds without giving rise to septic poisoning, unless in exceptional cases; but this was perhaps often due to pathogenic organisms being absent, though the non-pathogenic organisms of putrefaction abounded.

The President said Dr Felkin's paper was an interesting and instructive one, but not quite convincing to his mind. He did not think the evidence brought forward sufficiently exact and authentic, excepting what depended on Dr Felkin's personal experience, to found any strong opinions upon. You could not get certain conclusions from vague premisses. He had always thought, with Professor Simpson, that the ease and rapidity with which labour was passed through by the savage races depended primarily on the smaller size of head. Dr Felkin, he thought, laid too much stress on the nervous system as a factor in puerperal disease. The fact that, since the introduction of a strenuous antiseptic treatment into the management of lying-in women, death from septic causes had almost entirely disappeared from certain large maternity hospitals in Paris, Copenhagen, and elsewhere, was to him proof positive that the question of sepsis in midwifery had to do with external conditions, and was independent of the influences of race. And if this were true of midwifery, it was likely to be equally true, though not so easily proved, in relation to wounds and injuries. It was a pity that Dr Felkin had excluded zymotic diseases from the present investigation, because experience seemed to show that, although savage and semi-civilized races might recover more quickly and certainly from

severe injuries than those more civilized, the reverse was true of zymotic disease; the records, for instance, of cholera and measles showed a very high mortality among barbarous tribes.

Dr Felkin, in reply to Professor Simpson, said he was afraid that he had enlarged rather too fully upon the nervous susceptibility of different races; yet he felt that it must be admitted that Europeans and Negroes do vary in their susceptibility to suffer from the diseases of the nervous system. The mortality per thousand at Sierra Leone has been found to be 43· amongst whites as against 16· in Negroes.[1] With regard to the action of the white corpuscles, he thought that valuable information might be obtained which would probably explain many differences met with amongst various races. He agreed with Professor Simpson in thinking that the size of the fœtal head in relation to parturition was of great importance, and this point is illustrated by the greater frequency of difficult labours which occur in native women who have crossed with men of other races. As is well known, difficult labours occur where Arab and Egyptian men marry Negro women. The latter have dolicho-cephalic heads (73·40), the Arabs' heads are dolicho-cephalic (74·06), and the Egyptian heads sub-dolicho-cephalic (76·39). The pelvis in the Negro is wedge-like.[2] Certainly the proportion of the fœtal head to the pelvis in a Negro is less than it is in this country; at the same time, it must be borne in mind that the African child is exceedingly well developed when born. In answer to Dr Foulis, Dr Felkin said that in using the term civilisation he had certainly intended to include many of the points referred to by Dr Foulis. He considered that the dregs of society as seen in the Cowgate were quite as much the outcome of civilisation as were the wisest of our scientific men; and at the end of his paper he had ventured to hope that the advance of science due to civilisation would in time counteract the increased liability to septic diseases, which he considered to be also the result of civilisation. In reply to Dr Matheson, Dr Felkin was ready to admit that, although uncivilized races were possessed of a greater resisting power to septic influences than civilized peoples, yet in all probability many other factors were at work in decreasing their liability to septic disease. It is quite possible, for instance, that they may possess a heightened and quicker metabolism, thereby having the power of more quickly eliminating morbific material from their bodies; and possibly also the practice of copious but harmless libations may wash out, so to speak, the morbific material. In reply to the President, Dr Felkin explained that he was obliged to put some limit to his paper, and that, therefore, he had had to generalize to some extent on the observations of others instead of always giving definite authorities and quotations. As the President would allow, it was impossible to

[1] *The Human Species*, p. 424.
[2] Topinard's *Anthropology*, pp. 242, 305.

obtain statistics with regard to many of the races mentioned; but he believed that where statistics were obtainable, as, for instance, to some extent they were in India and America, they supported the points in his paper. In conclusion, Dr Felkin begged to thank the Fellows of the Society for the way in which they had received his paper.

MEETING VIII.—JULY 24, 1889.

DR UNDERHILL, *President, in the Chair.*

I. *Dr Brewis* showed—(1.) UTERINE APPENDAGES, presenting the condition of HÆMATO SALPINX, which he removed from a patient who had been sterile and had suffered from severe pelvic pain for fourteen years. The uterus was retroflexed, and the ovaries, to which the disturbed tubes were firmly attached, were embedded in adhesions low down in the pelvis. The blood contained in the tubes was in a fluid state. (2.) A PAIR of greatly thickened FALLOPIAN TUBES presenting the characters of CHRONIC SALPINGITIS removed from a patient who had suffered pain for sixteen years.

II. CASE OF HEART DISEASE COMPLICATING LABOUR TREATED SUCCESSFULLY BY NITRITE OF AMYL.

By W. FRASER WRIGHT, M.B.

I HAVE much pleasure in recording the following case which occurred at the Glasgow Maternity Hospital during my period of house surgeonship. It illustrates the serious effect that labour has sometimes on heart lesions, and especially the danger to be feared in the third stage.

Mrs F., æt. 36, iii.-para, was admitted on the 7th April 1889 at 11 P.M. On admission she was in a very bad state, too ill, indeed, to give any reliable account of her condition. When called to see her I found patient sitting up in bed struggling for breath, any attempt to lie down being followed by a feeling of suffocation. The face was cyanotic and of a grey hue, lips livid, pupils dilated. In addition she was much troubled with severe cough and expectoration of frothy, muco-purulent, blood-stained sputum. The history (taken twelve hours after admission) showed that she was now in her third pregnancy, and at full time. The first two labours were easy and normal, the last occurring two years before. During each of these pregnancies there had been slight swelling of the legs and feet, but not nearly to such an extent as in the present case. Since birth of last child she enjoyed good health till five months advanced in this pregnancy, when she began to suffer from cough and shortness of breath. About same time her right leg and foot

began to swell, the left side swelling only a fortnight before admission. There was no history of rheumatism. Labour pains came on early in the morning of the day on which she was admitted, and continued, though feebly, throughout the day. Owing to her serious condition it was impossible to make a thorough examination. The heart sounds could not be made out owing to the presence of adventitious breath sounds, râles and rhonchi. Pulse 130, weak, irregular in volume, and slightly in rhythm. Respirations 44. Temperature normal. Urine contained no albumen. She was put on 3 m. doses of tr. of strophanthus every hour, alternating with tablespoonful doses of brandy, and under this treatment she greatly improved, the breathing especially becoming much easier. In the morning it was possible to make out the character of the heart sounds. A well-marked murmur was heard in mitral area replacing first sound. There was also a faint presystolic murmur, both conducted into left axilla. Second sound somewhat impure. In the aortic area the first sound was normal, but the second was replaced by a murmur conducted down and heard very distinctly over base of sternum. Second sound in pulmonary area slightly accentuated. Other sounds normal. The lesion, apparently, was a double one—aortic regurgitation with mitral stenosis and incompetence. Numerous râles and rhonchi heard all over chest. On palpating abdomen the uterus was very large; and it was thought to be probably a case of twins, but of this I could not be sure, owing to the difficulty with which palpation was done while she was in a sitting posture. No fœtal heart sounds could be heard.

Per vaginam.—Cervix obliterated and os uteri slightly open. Only one fœtus could be felt, and it presented by head. There was much liquor amnii, ballottement being very distinct. Strophanthus was now replaced by digitaline granules, and she continued to improve during the day. Labour pains came on at intervals, and although not very strong, the os was dilated to size of a florin in the evening. The labour proceeded without any noteworthy incident, till at 10.30 P.M. on the 10th, *i.e.*, seventy-two hours after admission, she gave birth to twins. Both were very small and dead. There was a considerable amount of liq. amnii. The first child presented by head, and second by breech. The placenta, which was single, with two cords and two sets of membranes, was expelled with the second child. Scarcely any blood was lost, and no ergot given. Up till the birth of the placenta the labour was comparatively easy; the dyspnœa and distress from which she suffered on admission still existing to a certain extent, but not being so great as to cause much anxiety. Immediately the placenta was expelled, however, a sudden change took place. She was seized with great difficulty of breathing, coughing, and pretty free hæmoptysis, the face becoming very livid, so that she was in extreme danger of dying from suffocative engorgement of the lungs. The

indication being, therefore, to relieve this great congestion, I was about to bleed her from the arm when I resolved to try the effect of nitrite of amyl. I had previously seen it do great good in a condition somewhat similar, viz., in a case of severe dyspnœa in a man, due to mitral disease. She therefore got five or six drops to inhale, and the effect produced was very marked; the breathing immediately became easier, the lividity of the face passing off and being replaced by red flushings. There was, however, not much bleeding from the uterus. Still, a small quantity of blood did escape, probably about 8 oz., but this is merely approximate. She continued in her improved condition, and was soon out of immediate danger. The digitalis was administered for a few days longer, and fourteen days after she left hospital feeling very well.

This case is, I think, of some interest in connexion with the similar cases recently reported by Dr Hart, and more particularly with regard to the treatment recommended. There can be no doubt that this woman was in imminent danger from the great engorgement of the lungs and right side of the heart. The indication, therefore, was to relieve this engorgement, and no doubt bleeding would have done so, but I had an idea that nitrite of amyl might have a beneficial effect; and so the event showed. How this came about I am not exactly prepared to say. But there are at least two possible explanations:—

The first is by its action on the uterus. I had hoped and expected free bleeding and relief in this way. But while there was a certain amount of blood lost after its administration, it was not, I think, sufficient to account for the immediate benefit she derived. Perhaps, however, it was. Although the action of this drug on the uterus has not been definitely determined, there seems some reason to believe, arguing from its action on non-striped muscle generally, that it will cause relaxation. Dr Barnes, indeed, recommends its use in some cases of tedious labour before applying forceps, and states that it will relax the uterus in two or three minutes. For this purpose he prefers it to morphia, chloral, or even chloroform. Then, again, cases are recorded in which it has caused (at least apparently) severe hæmorrhage when given in eclampsia. In this case I regret that the effect on the uterine muscle was not noticed, but from the fact of there being so little bleeding, I fancy there was not much relaxation.

The second explanation is, that by dilating the arterioles, and so allowing a greater quantity of blood accommodation in the periphery of the circulatory system, the heart would be required to hold less blood. I am well aware that this is open to serious criticism, as the effect of nitrites is to increase the amount of blood in the veins by dilating arterioles, but still it is not improbable that the extra amount of blood thrown on the circulation after the placenta is expelled may find room in the dilated arterioles and capillaries, and it is while these are filled that the quantity of

blood in the heart is diminished. The fact remains, however, that great relief was obtained by its use, and this, I think, will warrant its being tried in suitable cases before recourse is had to venesection.

Dr Berry Hart thought Dr Fraser Wright's paper contained a very valuable suggestion. So far as Dr Hart knew, the treatment was original and well worthy of repeated trial.

Dr J. W. Ballantyne had not had any experience with nitrite of amyl after the expulsion of the placenta in cardiac cases, but in one case he had used it for the purpose of relieving severe anginal attacks in a case of mitral disease complicating pregnancy. In this case the nitrite of amyl seemed to make the heart pain worse, and if Dr Fraser Wright's theory be correct, one need not be surprised at this result, for, during pregnancy in mitral disease any dilatation of the arterioles would most probably increase the painful heart contractions, whereas, in cardiac cases, after the expulsion of the placenta the nitrite of amyl would, by dilating the arterioles, relieve the distended right heart. The fact that he, Dr Ballantyne, had not found relief to follow the use of nitrite of amyl in pregnancy would, therefore, go to support the procedure proposed by Dr Wright, and to show to some extent the *modus operandi* of the drug in the post-partum condition.

Dr W. Fordyce asked Dr Wright if, in a similar case, he would give the nitrite of amyl at the same time, *i.e.*, after the placenta was born, and if he thought any good might result by giving it sooner, either before the placenta was born or immediately afterwards; for it has been pointed out that the danger to patient lies in the sudden engorgement of the right side of heart after the placenta is born. By causing dilatation of the arterioles before the placenta was expelled, the pressure in the right side of the heart, which must in mitral stenosis be above normal, would be lessened, and when placenta was expelled, and the extra amount of blood entered the left ventricle, it would be more able to withstand the sudden engorgement, as the tension had been previously lessened owing to increase of blood by the dilatation of the systemic arterioles. Also suggested a difficulty in explanation of *immediate* relief to patient by the dilatation of the arterioles—in fact, that before the blood from right side of heart reached the systemic circulation, it had to pass through the already engorged lungs and a stenosed mitral orifice.

The President congratulated Dr Wright on his prompt and successful treatment of this very serious and anxious case. Those who had watched cases where labour was complicated by severe heart disease knew well how immediate was the danger and how trying was the anxiety. He thought the use of nitrite of amyl in this case was a just deduction from a scientific knowledge of the properties of the drug. In trying to find an explanation

for its instantaneous good effects, we must not overlook the fact that the blood was a continuous whole, and that when an extra quantity of it was let off, as it were, into the systemic arterioles, the effect was to diminish greatly the tension in the whole system. The tension of the right ventricle was diminished equally with that of the rest of the circulation, and the almost paralyzed heart was thus enabled to act again with advantage. In the cases of this kind he had seen the danger was very great, but it also seemed to be soon over.

Dr Fraser Wright, in reply, said he would like to point out, that in Dr Hart's case the extreme pallor of the face which preceded death indicated contraction of the peripheral system, and nitrite of amyl would very likely have given great relief. It was unnecessary to anticipate the difficulty or danger, as Dr Fordyce suggests, as it was time to use the drug when danger threatened, and that was when the placenta had been expelled. He had to return thanks for the kindly way in which the communication had been received, and hoped it would lead to a trial of this remedy in suitable cases.

III. SOME CASES OF INTRAUTERINE HYDROCEPHALUS, WITH REMARKS.

By C. E. Underhill, M.B., F.R.C.P. Ed.

I venture to bring this short note before the Society because cases of labour complicated by hydrocephalus are not very common—about 1 in 3000, according to Spiegelberg—and they are too often not diagnosed until serious injury has been done; and, moreover, the subject has not been brought up here for a considerable time. In the year 1878 the late Dr Angus Macdonald related a case with a valuable and elaborate commentary, and in the following year Dr Croom made a shorter contribution on the subject.

Case I.—Mrs P., aged 35, fell in labour with her ninth child on 11th February 1886. She had had seven fairly easy labours at the full time, and one anencephalic fœtus at the seventh month. She attributed the deformity to being frightened by a large dog. She was seen several times by her medical attendant, and at 2 A.M. on the 12th, as no progress was being made, and the head was still above the brim, he applied the forceps. There was a difficulty in locking them, and after making slight traction, he suspected the nature of the case, removed the forceps, and endeavoured to turn. As he found difficulty in doing this, he sent for me at 4 A.M. I found by combined external and internal examination a very large head partly pushed away from the brim, which it had not entered, and one foot in the vagina. With some difficulty I seized and

brought down the second foot, and completed the turning. The neck and face came easily into the pelvis, but the head much more than filled the brim. Traction was made for a short time, but, the head not advancing, I proceeded to perforate. This was not at all easy, as I could not without risk reach the parts above the ear, and the only instrument at hand was a Smellie's perforator with one prong broken. I succeeded in making an opening in the back of the neck, which lay to the left and forwards, and then pushed in the instrument, intending to perforate through the foramen magnum into the skull. A large quantity of fluid escaped, and the head then came through without any difficulty. I found the perforator had entered just below the occipital protuberance. The fluid was, as usual, contained within the ventricles, as it did not flow until I had pushed the perforator well in. There was a spina bifida as large as an egg about the middle of the dorsal region. It was not tense. I punctured it as a first step, in hopes that the fluid contained in it communicated with that inside the cranium, but very little came. The placenta came away easily, but the membranes were retained, and I had to introduce my hand into the uterus to remove them. There was a good deal of hæmorrhage, but the patient made an excellent recovery. The fœtus was a female, and the head very large—the largest I had then seen in the fresh state. This case occurred in Staffordshire, where I was staying for a few days.

CASE II.—Within a year after the occurrence of Case I., viz., 26th July 1887, I saw, in consultation with a friend near Edinburgh, a very similar case. The patient, Mrs P., aged 38, was a v.-para, all of whose previous labours had been easy. The breech presented and came slowly down, but the head was delayed above the brim. Steady traction failing to advance matters, an effort was made to apply forceps, but when with difficulty they had been locked, the handles were seen to be wide apart. I was then sent for. With the previous case fresh in my memory, I naturally guessed, before seeing the patient, that the difficulty might be due to a similar cause. On making a careful combined examination, there was no difficulty in deciding that the head was of great size, as the external hand found it completely filling and overlapping the inlet of the pelvis, while the internal hand made out the widely separated cranial bones and the tense and elastic condition of the sutures. The cord had for some time ceased to pulsate. Drawing the body well up in front, I easily perforated with Simpson's perforator just above and behind the left ear, and let out a quantity of fluid which was estimated at three pints. The head was then easily pulled through. It was larger than the previous one, and the body was, as is not common in these cases, fat and well nourished. The mother recovered well, and has had a healthy living child since.

These are the only cases I have met with where there was a very large quantity of fluid within the cranium, but I have met with four more where the condition was sufficiently well marked, and in one of which the mother's life was lost. I have only preserved very brief notes of them, and shall give them in the order in which they occurred.

CASE III.—On 24th November 1871 I attended Mrs W., aged 24, in her second confinement. She had borne healthy twins at the full time on 21st December 1870. The labour was an easy one, but I was puzzled by the condition of the presenting part, the head, owing to the extreme looseness and mobility of the bones. When the fœtus, a female, was born, it was found to have been dead some days, and the skin was peeling off. The head was very large and collapsed; it had evidently been hydrocephalic, and the fluid had escaped in some manner which I could not discover. I opened the head, and was surprised to find the brain to be reduced to a small mass not much bigger than a walnut, and reminding me of the appearance of the stump of the brain sometimes seen in cases of anencephalus. Had the fluid been retained in the cranium, and the child been alive at the time of labour, there would certainly have been much difficulty. The mother had an attack of perimetritis, brought on by getting up and walking about on a cold floor in her night-dress on the second day after delivery, but eventually recovered.

CASE IV.—On 13th June 1880 I was called to Mrs R., aged 31, in labour for the fourth time. Her previous labours, she told me, had been normal. I found the breech had been born for some time, and the cord had ceased to pulsate. The arms were easily pulled down, but there was great difficulty in bringing through the head. The pelvis seemed of full size, but the head remained at the brim; the question of hydrocephalus occurred to us, and another practitioner who was associated with me in the case went for a perforator. In the meantime, by steady dragging on the body and pushing down the head from above, the fœtus, a male, and dead, was delivered before his return. The head was large and tense, and contained a moderate quantity of fluid. The birth was followed by a good deal of hæmorrhage, and I feared the cervix was torn, but, with the exception of some incontinence of urine, which lasted for twenty-four hours, the recovery was satisfactory, and entirely without rise of temperature. The patient, however, suffered for some months from a feeling of discomfort and looseness in the pelvis. I regret that I did not wait and perforate in this case, as the child was already dead, and dragging so large a head through the soft parts put them to a degree of strain and tension which it would have been better to avoid.

CASE V.—On 30th May 1882 I was asked to help a friend in

delivering Mrs E., a short distance out of town. I have no note of her previous history. The head presented in the fourth position, and forceps had been several times applied, but had slipped off. When I first saw her she was a good deal collapsed, there was a hæmatoma of no great size on the left side of the vulva, the head was above the brim, it was soft and pulpy and freely movable, and I was suspicious that the uterus was ruptured. The case being urgent, I turned without loss of time, and delivered with some difficulty a dead hydrocephalic fœtus. The placenta was subsequently removed from the peritoneal cavity. The hæmatoma gave way during these manipulations, but to my surprise there was very little bleeding from it. The patient was, however, by this time in a very weak state, and she died from shock a few hours later. The fœtus was large, and the head contained a moderate quantity of fluid.

There was no post-mortem on this melancholy case, and the patient was far too ill for me to attempt to make any exact estimate of the amount or position of the rupture in the uterus.

CASE VI.—On 29th September 1882 I was asked by a friend to see with him Mrs M., aged 39, in her eighth labour. She had been delivered without difficulty in her previous confinements. The breech presented and came down easily, but the head had been retained in the brim for two hours before my arrival. From the history of the case I suspected a hydrocephalus, but getting my fingers into the mouth, I was enabled to pull the head through without much trouble. The fœtus was a large and fat male with a huge collapsed head, which when full of fluid must have been of great size. I examined carefully for any tear in vaginal outlet or in cervix, but could find none. A quick recovery followed.

Remarks.—The difficulty in dealing satisfactorily with cases of hydrocephalus lies confessedly in the diagnosis; or rather, it may be said that as the condition is a rare one, it is apt to be overlooked, because no thought or suspicion of it has entered into our minds. For when once we suspect that we have to do with a hydrocephalic head, and direct careful attention to the point, the difficulty is in most cases not very great. Now, I think it might almost be laid down as an axiom, that when in a woman who has previously had easy labours, and who is otherwise in good health, we find the head delayed above the brim in spite of severe labour pains, we ought at once to suspect and to look for hydrocephalus. The history of midwifery contains numerous records of cases such as this, where the condition was not discerned until too late, because it was never suspected. And when we do look for it, I believe external palpation to be perhaps the most valuable means of diagnosis. The head is felt easily above the pelvis, filling up and overlapping the edges of the inlet of the pelvis. And the diagnosis is confirmed by a combined examination, the internal hand both assisting to

measure the size of the head, and also discovering the widely separated bones and the tense sutures of the distended cranium. In fact, if we have the possibility of this condition in our minds we shall not often overlook it. In my opinion the diagnosis is more easy when the feet present, or after the fœtus has been turned. It is then, it seems to me, more easy to estimate the size of the skull, as well as to feel the bulging in the temporal regions. Sometimes the diagnosis is assisted by finding the body of the fœtus small and emaciated, and yet the head unable to enter the pelvis. But this cannot be relied on, as in two of the cases just related the body of the child was large and fat.

A further point, which sometimes assists in making the diagnosis, is the relatively small size of the face in comparison with the bulky forehead, with its large frontal suture and widely separated frontal bones. The earlier the diagnosis is made the better, because it must not be forgotten that the danger of rupture of the cervix—the great danger in these cases—is greatest before the os is fully dilated. The round incompressible head does not dilate the os as quickly as the head of ordinary shape and moulding, and all this time the upper part of the cervix is stretched and thinned to a dangerous degree.

There are two conditions in which the history of the case gives us no help, and here we are more likely than ever to overlook it. The first is in primiparæ who have no puerperal history, but fortunately hydrocephalus is a very rare complication of primiparity. The second is in pelves known or found to be contracted, where the examination is in itself more difficult, and we are also the less likely to look for hydrocephalus, because there is another and simpler reason for the delay in the labour. Moreover, it is much more difficult in such a case to estimate justly the relative parts which narrowness of pelvis and size of head play in obstructing the labour. In these circumstances the diagnosis will rest mainly on an accurate bimanual examination under anæsthesia.

With regard to treatment, the question arises, Where the diagnosis of hydrocephalus has been made, are we justified in applying forceps in the first instance; or if the child presents by the breech, are we justified in making prolonged traction before we have recourse to instruments for extracting the fluid? My own feeling is that we are not. The danger to the mother is so imminent, and the life of the child is of so little worth even if it be born alive, that I think there should be no hesitation in taking at once the decisive step. For a similar reason I cannot think that it is good practice to perform version in these cases. By such a course there is very little chance of saving the life of the child, and the risk to the mother is certainly increased. It is much easier to pierce the presenting than the after-coming head; indeed, if the head be very large, and the pelvis at all narrowed or the vagina tight, perforation of the after-coming head presents considerable difficulties. In one

recorded case this difficulty was so great that it was found necessary to puncture the skull through the hard palate; and in my first case I found it by no means easy to make my way into the cranium through the back of the neck.

It is generally recommended to use a trocar for puncturing the skull, so as to give the child the very slender chance of surviving, as the operation done in this way is not necessarily fatal. In the two cases in which I opened the head the child was already dead, and this question did not arise. I used the perforator because it was at hand. In two of the cases it was noted that when the child was born the fluid had disappeared, and the head was baggy and collapsed. Sometimes the head gives way during the course of the labour, and the fluid escapes then; but in one of these cases, in which the child was dead and decomposing, it had certainly been absorbed, or made its escape some time before.

Dr Freeland Barbour referred to a case recorded by Benckiser, which shows that hydrocephalus may cause rupture of the uterus even during the first stage of labour. This case was of interest in relation to the thinning of the lower segment, which takes place even in normal labour; and it was of practical importance to remember that in hydrocephalus this thinning might go into rupture before the cervix was dilated.

The President, in replying, stated that the two points he specially wished to emphasize in the paper were,—firstly, the importance of the history of the case in suggesting the diagnosis of hydrocephalus; and, secondly, the risks incurred in dragging through the pelvis a head which was even moderately distended instead of proceeding at once to puncture. These risks were the damage liable to be done to the soft parts, vaginal wall, bladder, etc., and also to the joints of the pelvis.

IV. *Dr Allan Sym* read the following remarks on INJURY TO FŒTAL NECK THROUGH PRESSURE OF UMBILICAL CORD:—Mrs R. was delivered by me on the 29th May. The labour was tedious, and forceps had to be applied with the head in transverse position, the blades being on the occiput and sinciput. When the child's head was born it was noticed that the cord was tight round the child's neck. My patient had severe post-partum hæmorrhage, which prevented me from paying any attention to the child beyond seeing that it respired satisfactorily.

Next day my attention was directed by the nurse to the child's neck, and I found an ulcerated surface on the right side about the length and breadth of my little finger, and tailing away at each end into a well-marked groove, which extended round as far as the border of the trachea in front. The ulcerated surface was sloughy in character, and before I got it healed several small sloughs came away. It is interesting to note how much pressure had been

exerted by the cord in the neck so much as to cause destruction of tissue without injuring the life of the child. One would have expected under the circumstances that the child would have been still born, but on the contrary he is a very healthy boy. I think no apology is necessary to the Society for bringing before it such a peculiar and uncommon case.

V. *Dr Allan Sym* read also the following note on a case of ANNULAR HYMEN:—On the 22nd of last month Mr B. called on me, and explained that he had been married three days previously, and had come to Edinburgh the same day, and resided in one of the Princes Street hotels. He complained that he had been unable to consummate the marriage on account of some obstruction at the orifice of the vagina, and requested me to see his wife. I called next morning, and saw Mrs B., and on examination found a very thick, tough hymen, with an annular aperture that would hardly admit of the passage of a pea. As the parts were very tender I applied a solution of cocaine, and then by the aid of a pair of scissors and digital pressure I succeeded in breaking down the hymen. The hæmorrhage was slight, and was easily controlled by a plug of absorbent wool. Mr and Mrs B. left town on the following day, but in a note which came from them recently I was informed that everything was satisfactory. Mrs B. was quite young, somewhere about 25, and her husband some ten years older. The hymen was extremely tough and thick, and I was not in the least surprised that it had not been ruptured.

This case I have reported on account of its uncommon nature. A year or two ago Dr Halliday Croom reported a case in which he had to catheterize a patient for reflex irritation after rupture of the hymen, but the cases where medical assistance is required to cause the rupture are, I think, of rare occurrence.

Dr Milne Murray stated that two years ago he saw an almost identical case under similar circumstances. Dr Brewis assisted him by giving chloroform, and he caught the thick edge with catch forceps, nicked it in two places, and tore the hymen freely with the fingers. The condition gave no further trouble.

Dr Ballantyne had seen a case similar to that reported by Dr Sym, and under very similar circumstances; and the *President* made some remarks.

VI. REPORT OF THE ROYAL MATERNITY AND SIMPSON MEMORIAL HOSPITAL—DR UNDERHILL'S QUARTER: FEBRUARY–APRIL, 1889.

By ROBERT A. FLEMING, M.A., M.B., and C.M., Resident Surgeon.

INTERN CASES.

DURING the quarter 71 women were delivered in the Hospital. Twenty of these patients were married, showing a decided increase

in the number of such women enjoying the benefit of the Institution. 38 were i.-paræ, 13 were ii.-paræ, 7 were iii.-paræ, 2 were iv.-paræ, 3 were v.-paræ, 2 were vi.-paræ, 2 were vii.-paræ, 1 was an viii.-para, and 3 were ix.-paræ.

Age.—(*a.*) Primiparæ: average age, 22 years 2 months; youngest, 17 years; oldest, 37 years. (*b.*) Multiparæ: average age, 28 years 1 month; youngest, 21 years; oldest, 38 years.

Duration of Labour.—(*a.*) Primiparæ: average duration of first stage, 15 hours 43 minutes; longest, 60 hours; shortest, 3 hours. Average duration of second stage, 2 hours 33 minutes; longest, 15 hours; shortest, 15 minutes. Average duration of third stage, 18 minutes; longest, 35 minutes; shortest, 5 minutes. Average duration of whole labour, 17 hours 18 minutes; longest, 63 hours 30 minutes; shortest, 5 hours 40 minutes.

(*b.*) Multiparæ: average duration of first stage, 6 hours 48 minutes; longest, 19 hours; shortest, 40 minutes. Average duration of second stage, 1 hour 30 minutes; longest, 9 hours; shortest, 30 seconds. Average duration of third stage, 17½ minutes; longest, 35 minutes; shortest, 2 minutes. Average duration of whole labour, 8 hours 20 minutes; longest, 21 hours 5 minutes; shortest, 1 hour 15 minutes.

Presentations and Positions.

(*a.*) *Primiparæ.*—I. Longitudinal. (1.) Cephalic: vertex, L.O.A. 23, R.O.A. 6, R.O.P. 6, L.O.P. 1; uncertain, 2. II. Transverse, 0. Total, 38.

(*b.*) *Multiparæ.*—I. Longitudinal. (1.) Cephalic: L.O.A. 26, R.O.A. 2, R.O.P. 4, L.O.P. 0. (2.) Pelvic: breech, R.S.P. 1. II. Transverse, 0. Total, 33.

Sex and Weight of Children.—(*a.*) Primiparæ gave birth to 22 males and 16 females. Average male weighed 6 lbs. 11 oz.; heaviest, 8 lbs. Average female weighed 6 lbs. 14 oz.; heaviest, 8 lbs. 4 oz. (*b.*) Multiparæ gave birth to 17 males and 16 females. Average male weighed 7 lbs.; heaviest, 9 lbs. Average female weighed 6 lbs. 14 oz.; heaviest, 9 lbs. 10 oz.

Length of Children.—The average male measured 19⅓ inches; longest, 21½ inches. The average female measured 18½ inches; longest, 20½ inches.

Placentæ.—Average weight of male placenta, 1 lb. 5 oz.; heaviest, 1 lb. 13 oz. Average weight of female placenta, 1 lb. 10 oz.; heaviest, 2 lbs. 7 oz.

Cord.—Average length of male cord, 24¾ inches; longest, 34 inches. Average length of female cord, 24½ inches; longest, 36 inches. Insertion in 1 case velamentous, and in 4 marginal. In 14 cases the cord was once round the neck, in 1 case twice, and in 1 thrice. In several of these cases, so tightly was the cord twisted that the child was cyanosed at birth. In one case the cord was twisted round the right arm; in this case artificial respiration had to be carried on for twenty-five minutes. One instance occurred of

a knot on the cord. The patient was a ix.-para. The child, which was about the seventh month, breathed for two hours after birth.

Peculiarities of Children.—In one case, a primipara, aged 25, gave birth to a female child, weighing 6 lbs. 13 oz., whose abdomen, pleuræ, and pericardium were distended with a clear yellow serous fluid. The limbs and trunk were œdematous, the skin pitting deeply on pressure. The child's face was somewhat cyanosed at birth. A careful post-mortem examination failed to show any congenital cardiac deficiency. The kidneys appeared small and somewhat atrophied. (A report of their microscopic structure has not yet been obtained.) It is of interest to note that the placenta weighed no less than 2 lbs. 7 oz., the heaviest placental weight recorded during the quarter. There was in one instance a sanguineous discharge from the vagina of a newly-born child. The child at birth weighed 9 lbs. 10 oz. The discharge, which was small in amount, persisted for four days.

Classification of Labours.—Natural, 45; laborious, 18 (lingering 2, instrumental 16); preternatural, 1; complex, 4; abortive, 2.

Natural Labours.—In 4 cases the second stage was precipitate, and 5 cases were premature.

Precipitate Labours.—In 1 case the child was born in the bath-room. In another, patient had been allowed by the nurse to use the night-stool. In a third, the patient woke up suddenly from a short sleep, uttered a cry, and before the nurse could be summoned the child was born.

Premature Labours.—4 were at the eighth month, the 5th being at about the seventh. Two of these were putrid; 2 were reared in the incubator successfully.

Laborious Labours.—There were 2 lingering and 16 instrumental labours. Low forceps were applied in 4 cases in which the head was delayed at the outlet. In 4 cases forceps were used in the cavity of the pelvis for persistent occipito-posterior position of head, and one of these cases terminated as "face to pubes." In one case, the large size of head; in one, prolapse of arm and hand in front of head; in two cases, relatively small size of pelvis in comparison with head; and in the remaining four cases, threatened inertia uteri and exhaustion of patient formed the indications for interference.

Preternatural Labours.—A seven and a half months' fœtus born in the R.S.A. position forms the one instance. The cuticle was peeling off, and a history of five weeks' cessation of fœtal movements, consequent on a strain, antedated the birth.

Complex Labours.—There was one case of twins at about the eighth month. The children were of different sexes. A girl, weighing 4 lbs. 7 oz., was born first; the boy, weighing 3 lbs. 11 oz., followed fifteen minutes later. There was a common placenta, but two distinct bags of membranes. The twins were reared in the incubator for two weeks, and both left the Hospital in perfect health. No hæmorrhage occurred either with or after the third stage.

Another complex case was that of a multipara, in which the anterior vaginal wall prolapsed in front of the descending head. The child, which weighed 9 lbs. 1 oz., had to be delivered by the application of forceps.

The third case has been already referred to under peculiarities of the cord, where a short cord was so tightly twisted round the child's arm, as to seriously interfere with the expulsion of the child.

The fourth case, one of ruptured uterus, is detailed at length further on.

Besides these, 2 cases were admitted, sent in as cases of placenta prævia. In one there was slight oozing of blood during the first stage, otherwise the labour was normal. In the other nothing in the course of the labour suggested even a marginal insertion of the placenta.

Abortion.—There was one abortion about the sixth month. Patient was a primipara, and single. No cause of the condition could be assigned. There was one case of threatened abortion, which was treated in Hospital with success. The patient left the Maternity undelivered.

Adherent Placenta and Membranes.—In one case the membranes were almost entirely adherent; in 4 cases they were partially so; and in one instance the placenta was partially attached.

Torn Perineum occurred in 7 cases. In 5 the tear was trifling; in 2 more severe—in one of these being almost up to, though not through, the sphincter ani. Carbolized gut, and on two occasions silkworm gut, were used, and very rarely did even one stitch slip. In the case where the tear extended up to the sphincter ani, owing to considerable hæmorrhage and the rapidity of the pulse, the tear was left unsewn. It largely contracted before the patient left Hospital, but she was directed to return, in order to get it remedied later.

Post-Partum Hæmorrhage occurred in only one instance, the one just referred to. The first and second stage had been unduly long. The position was occipito-posterior, and the patient was much exhausted before the labour was terminated by the application of forceps. An intrauterine douche of water at about 120° F. was used, and the uterus firmly compressed between the two hands, one external and one internal. No bad result followed, the patient making an excellent recovery. The child in this case weighed 8 lbs. 2 oz., while the mother, a primipara of 17 years, was undersized.

Fœtal Heart.—The fœtal heart was carefully examined in every possible case before delivery, with the view of testing the accuracy of the statements made, with regard to the diagnosis of sex by the number of heart beats per minute. The size of the child was found much more than the sex to determine the heart-rate.

Ophthalmia Neonatorum.—Nitrate of silver solution, 1 in 50, was

used from the beginning of the quarter, a drop or two being introduced under the lids immediately after birth. The result was that in only two severely, and in one child slightly, did the condition manifest itself. In one of these two cases a gonorrhœal discharge was proved in the case of the mother. This case for a long time resisted treatment, and a small corneal ulcer developed in each eye, but all inflammation had ceased by the time it left the Hospital.

Mammary Abscess occurred in two cases, in both after the patients had left Hospital. Both abscesses were readily cured.

Puerperium.—There was no instance of either phlebitis or phlegmasia. In about a dozen cases a slight papular urticaria developed itself about the third day, and persisted for about two days. In several of these the condition was accompanied by increased fœtor of lochial discharge, but without rise of temperature. In four cases the lochial discharge became offensive, but in only two cases were there pronounced febrile symptoms. In only one case did the temperature at any time register 104° F. In one case the discharge remained for three weeks of a red colour, but there was no instance of severe hæmorrhage during the puerperium. A patient suffering from a severe attack of puerperal fever was found in Hospital when the quarter commenced. This woman died on the 3rd of February. No other case occurred.

Mortality.—(1.) Maternal, 2 cases. One was the case of puerperal fever referred to above, the other was the case of ruptured uterus described at length separately.

(2.) Fœtal, 6 cases. Two were putrid, one of these being premature; one was an abortion; one was dropsical at birth and still-born; one child was apparently suffocated by the cord being twice tightly round neck; the sixth was in the case of ruptured uterus.

(3.) Infantile, 3. In 1 a premature child of 7½ months lived for 2½ hours. In another the child of a woman, an viii.-para, the last six of whose children were born dead, lived four hours. There was no distinct evidence of syphilis. In the third case child died three days after birth, being overlain by the mother.

Case of Rupture of the Uterus.

Mrs H., æt. 38, ix.-para, full time. Her first and seventh children were delivered with forceps. All the other labours were normal in every way. A large, heavy woman, with a very pendulous abdomen. She enjoyed good health during the whole course of her pregnancy. Labour commenced at her own home. The waters began to dribble on the 24th February, and on the 25th, at 3 A.M., waters broke with a rush, when pains came on pretty strongly.

At 5 A.M. a midwife unconnected with the Maternity arrived, and states that when she made a vaginal examination the os was

high up and as large as a florin, head presenting. Patient complained at intervals of a suffocating feeling in chest. The pains continued strong; pendulous belly remained unsupported. At 6 A.M., as labour was not advancing, ergot was administered by the midwife, which was followed by pains, increasing in force. At about 7.30 A.M. they suddenly ceased, and patient complained of feeling great soreness in abdomen. Dr Butchard, of Leith, was sent for, who on palpation thought there might be twins, and P.V. he felt a soft mass protruding from cervix. A little blood followed the removal of the fingers. Patient was sent up by Dr Butchard to the Maternity Hospital. Patient lóst much blood both before and during removal to the Hospital.

When seen at 9.30 A.M. in the Maternity Hospital by the house-surgeon she was found to be blanched, with the exception of the lips which were well coloured, and was almost pulseless. Ether was given hypodermically, mustard applied to heart, and hot bottles placed round her in bed. On vaginal examination a large mass, which seemed to be the placenta, was felt. There was no hæmorrhage, except just during the process of examination. Dr Underhill was at once sent for, and Dr Barbour was also summoned.

The following is Dr Underhill's account of the case:—Patient was pulseless; extremities extremely cold; lips were dark red; eyelids rather pale; heart was beating pretty strongly, and not very rapid (98 per minute). She was quite sensible. The abdominal veins were unusually distended. Through the abdominal wall one child was distinctly palpated, and something like a second was also felt. Chloroform having been administered, Dr Underhill introduced his hand into the vagina and felt the placenta half protruding from a tightly contracted internal os. Behind the os and placenta the hand was passed through a very large rent into the abdominal cavity, when the fœtus was felt lying transversely, the head being towards the right side. The tear being so large, the feet were seized, and with little difficulty the child was delivered dead. The placenta was then easily extracted from uterus, which was contracted in the form of a ball and lying low down to the left side, the fundus being directed forwards. There was no great loss of blood so far. The abdominal cavity was now douched with hot water, about 120° F., a double drain (glass and rubber) being used. The water returned blood-stained, and it was followed by a free flow of dark venous blood. The patient began to toss her arms about and moaned, complaining of pain in the abdomen.

Dr Halliday Croom was called in consultation, and the advisability of abdominal section was discussed, but dismissed as impracticable. As the bleeding was still going on, the rent was then packed with iodoform gauze fastened in lengths, 5 to 6 yards being introduced. One-sixth grain of morphia was injected hypodermically, and twice, 25 minims of ether were also injected. No more

hæmorrhage ensued, but the patient gradually sank, dying at 4 P.M. She vomited twice before and once after delivery of the child.

The child, a male, weighed 9 lbs. 3 oz., and measured 21¾ inches. Placenta weighed 1 lb. 3 oz., and cord measured 23½ inches. A considerable quantity of blood-stained fluid was found in the air-passages.

Summary of Post-mortem Examination performed under Dr Barbour's Directions.—Abdominal cavity contained a large quantity of blood-stained fluid. On the intestinal coil were flakes of white matter [vernix caseosa (?)], but no recent lymph. On lifting uterus out of pelvis a large tear was seen on the lower aspect posteriorly. The tear begins about two-thirds down its posterior surface, and 7 inches from fundus, and passes downwards vertically for about 5 inches, of which 3 inches are in uterus, and 2 inches in the posterior vaginal wall. From right and left side of this tear, at level of posterior fornix, another tear extends transversely for 1 inch along pouch of Douglas to utero-sacral ligament on right side, but not quite so far on left. In upper two-thirds of vertical tear is seen posterior lip of cervix torn through irregularly and obliquely from above down and to right. Where this tear ends there is a band of transverse muscular fibres. Posterior vaginal wall is torn off cellular tissue between it and rectum.

Remarks by Dr Underhill.—This unfortunate case has several points of interest. It illustrates the great danger of administering ergot when the head is above the brim and the os undilated, and especially where the belly is pendulous, and the axis of the uterus almost at right angles with the axis of the pelvis. Had the uterus been properly supported by a binder, and the woman placed on her back, and had the ergot not been given, the result would in all probability have been a safe and easy delivery. Another point of interest was the comparatively slight symptoms produced by the rupture, supposing it to have taken place at 7.30 A.M. The patient felt some soreness at the bottom of the abdomen, and the labour pains stopped. Thirdly, the diagnosis by abdominal palpation was not easy. One child could be easily made out, and what seemed like the head of a second, which turned out to be the strongly contracted body of the uterus. Until vaginal examination was made with the whole hand, it was impossible to make out what had actually happened. The post-mortem showed the unusual condition of a large vertical tear crossed by a transverse one. It seemed most probable that the vertical tear was the first to take place, and the transverse portion of it was secondary.

Extern Cases.

During the quarter 189 cases were reported. Of these 27 were primiparæ, 162 were multiparæ.

Classification of Labours.—Natural, 156; laborious, 8 (instru-

mental 7, and lingering 1); preternatural, 5; complex, 6; abortions, 14.

Presentations.—Cephalic: vertex, 172; face, 0. Pelvic: breech, 5; doubtful, 2.

Positions.—Vertex cases: L.O.A. 155, R.O.A. 4, R.O.P. 10, L.O.P. 1. Breech cases: L.S.A. 2, L.S.P. 1; uncertain, 2.

Details.

Instrumental Labours.—Forceps were applied on seven occasions —four times for inertia uteri, twice for persistent occipito-posterior position, and once for rigid perineum.

Lingering Labours.—The only case recorded was one in which a brow presentation was gradually converted into an occipital (L.O.A.)

Preternatural Labours.—All breech cases. In 3 cases the child was premature and still-born. In 1 case, at which the house surgeon was present, after about half of the body had been born, the child made efforts at respiration. Rapid delivery had to be resorted to, the arms being pulled down and the head born by means of Smellie's grasp. Twenty minutes served to resuscitate the child. In another case, in which the placenta had begun to separate prematurely, much blood was found in the air-passages of the lung.

Complex Labours.—Twins, 3; typhus fever complicating labour, 1; prolapsus funis, 2. In 1 twin case, a iv.-para, the first child was born alive in the L.O.A. position. The second presented in the R.O.P. position, and a delay of three hours occurring, the house surgeon was sent for. By means of the high operation, the child was delivered face to pubis, still-born, all movement having ceased for over an hour previous to the application of forceps. With the first contraction of the uterus after the birth of the child a gush of dark blue blood came from the vagina. The placenta was promptly removed, and by pressure through the abdominal wall all hæmorrhage ceased.

In the second twin case the first child was born alive; the second was decomposing; the cord attaching it to a common placenta was plum-coloured.

In the third case both were born alive.

The typhus fever case will be mentioned separately.

In 1 case of prolapsus funis the mother was a ii.-para. A large loop of the cord was prolapsed below a head, which was in the L.O.A. position. Soon after the house-surgeon arrived the child was expelled spontaneously, still-born. The cord, when examined P.V., was found to be almost pulseless, and instrumental delivery offered little hope of rescuing the child.

In the other case of prolapsus funis the head, both feet, and a loop of the cord presented. The house-surgeon was summoned three hours after the waters had broken. On arrival he found the uterus tightly contracted round a seven and a half months' fœtus.

All the liquor amnii had escaped. Owing to the extreme tightness of the cervix and the excessive obesity of the patient, turning was found, even under chloroform, to be impracticable. Accordingly, as the cord still pulsated, the feet were replaced in utero, and forceps applied to the head. The child was easily resuscitated, but, owing to its premature condition, died in about five hours.

Abortions.—7 at about the sixth month, 2 at the fifth, 1 at the fourth, 2 at the third, and 2 at first month.

In 2 cases at the sixth month the whole ovum was born entire. In 1 case the fœtal heart beat for two hours.

In 1 case at the fourth month the secundines were partially retained, and severe hæmorrhage ensued. When the house-surgeon arrived he removed the remains of the placenta and membranes with his fingers, and by douching, and 5 grains of ergotine hypodermically, succeeded in arresting the hæmorrhage. The patient was so collapsed, however, that before leaving the house ether in 25 minim doses was twice injected, and mustard and hot bottles, etc., used. The patient made a good recovery.

Delay in the third stage occurred in 7 cases. In 3 cases the placenta had to be removed by the hand introduced into the uterus. In the remaining 4 cases the membranes were adherent.

Sex of Children.—Males, 93; females, 82.

Peculiarities.—One child at birth was very cyanosed, and remained persistently so for three weeks, till its death. No post-mortem examination could be obtained.

Mortality.—(1.) Maternal, 0; fœtal, 8, of which 2 were premature.

The following cases demand special description:—

I.—*Typhus Fever complicating Labour.*

Mrs M., æt. 37, an viii.-para, residing at Campbell's Close. Last labour had been aided by forceps; other labours were normal, and all her children were born alive. With the exception of a history of occasional epileptic fits, and a recent severe drinking bout, there was little of importance till the day before labour began, when patient complained of headache, pain in the back, and felt generally out of sorts. At 1 A.M. on the 21st April pains began. Two hours later a neighbour who was summoned found her semi-delirious. At 2.30 P.M. the nurses were sent for, and getting alarmed at the appearance and conduct of the patient, the house-surgeon was summoned. He found her lying unconscious in bed, occasionally muttering to herself or crying out shrilly for her husband. She lay perfectly still, excepting during the pains, when she endeavoured to get out of bed, being with difficulty held down. The room had a peculiar fœtid odour, and the skin and breath of the patient were similarly offensive. Her face was dusky in colour, the expression vacant and stupid looking. The pupils were equal, half dilated, and reacted, though sluggishly, to light. The

pulse was full, but the tension was poor between the beats; first sound of heart was indistinct; the tongue was brown and dry in the centre, and edged with white fur; over her chest and back there was a petechial eruption.

The pains were coming every fifteen minutes. On examination the cervix was found to be fully dilated, and the membranes already ruptured. No advance occurring with the pains, forceps were applied, and the child was delivered with ease. There was no hæmorrhage either with or after the third stage, and with the termination of the pains the spasms alluded to ceased entirely. The temperature was then taken, and it was 101°·5, pulse 115, and respirations 32.

At 11 P.M. the house-surgeon again visited the patient, and found her much more restless, temperature being 103°·6, pulse 121, and respirations 35. The diagnosis being now perfectly plain, patient was sent to the Fever house. The child, which was somewhat puny, had no spots upon the skin, and entirely escaped infection. This woman eventually recovered. Several other cases of typhus were subsequently sent from the same stair to the Fever Hospital.

II.—*Case of Puerperal Septicæmia.*

Mrs R., æt. 36, an xi.-para, after a rapid labour, was delivered of a healthy female child. In Chalmers Buildings, in which they lived, repairs and alterations were in progress, and a new soil-pipe had just been laid down, the existing one and the connecting pipes being removed.

On the third day of the puerperium the temperature suddenly rose to 105°, pulse being 121, and respirations 32. Quinine in large doses was administered, and an intra-uterine douche of corrosive sublimate (about 1 in 4000) given.

On the following day temperature fell to 102°, but next night it was again 105°. The lochial discharge was profuse and very fœtid. There was slight tenderness over lower part of abdomen on pressure. Dr Barbour was asked to visit the patient, but on examination he could make out no inflammatory deposit or peritoneal effusion. The douching was continued, and antifebrin and quinine both administered. The temperature invariably fell after the douche, remaining for twenty-four hours at 100° or so, but next day it was as high as ever. As the patient refused to submit to douching or further treatment, after attending on her for three weeks, the house-surgeon lost sight of the case.

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